

THE IRON AGE

THURSDAY, SEPTEMBER 3, 1891.

Electrical Appliances in a Rolling Mill.

Through the courtesy of our contemporary, the *Western Electrician*, we are enabled to present an illustrated description of two admirably designed electrical devices now in use in the rail mill of the South works of the Illinois Steel Company at South Chicago. The devices referred to are an electrical recording rail counter and an ingenious printing telegraph. The working of the two sets of apparatus will

will doubtless imagine that the construction was a comparatively easy task. For the benefit of the uninitiated, though, it must be stated that the position of the apparatus at the rail is such that it is subjected to about as hard usage as one could well imagine. Splashed with water and in the closest proximity to the red-hot rails, and thus alternately cooled and heated, it is not to be wondered that the present design of the water-proof casing inclosing the one moving part was arrived at only after much experience and several disappointments. As will be seen from Figs. 3 and 4, the contact lever proper is

numbers may be stamped upon every rail that leaves the mill. In addition to these numbers, the "pit" and "hole" numbers, *i. e.*, the furnace numbers—are also dispatched.

The system in its entirety consists of a receiver, Fig. 5, a transmitter, Fig. 6, three connecting wires and eight cells of gravity battery. The receiver on which the tape is printed is located at the finishing end of the mill, not a great distance from the point at which the contact lever of the rail counter is placed. This machine is in charge of a boy, who records on a blackboard for the use of the stamper

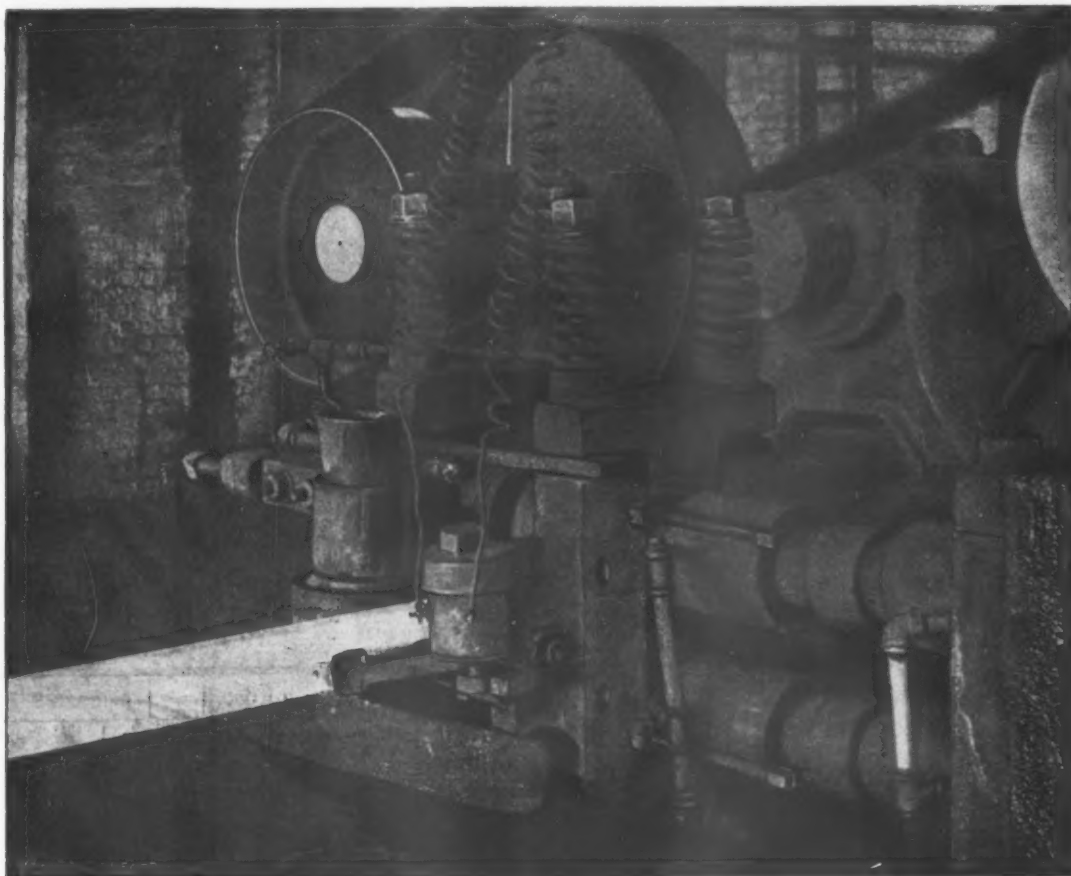


Fig. 1.—Electrical Recording Rail Counter.

ELECTRICAL APPLIANCES IN A ROLLING MILL.

be understood by a reference to the illustrations.

From Figs. 1, 2, 3 and 4 there may be obtained a very clear idea of the construction and operation of the electric rail counter. By means of this mechanism and a few cells of battery a tally of the number of rails rolled is kept in the office of the superintendent. Fig. 1 shows the location in the mill of the water-tight and heat-proof contact maker, or key through which an electrical impulse is sent into the office to operate the register or counter proper. This last mentioned device, Fig. 2, consists merely of an electromagnet arranged, as shown, to operate a lever escapement connected with a train of gears so proportioned and numbered as to constitute a counter. The contact maker, shown in position in Fig. 1, is simplicity itself, and after a glimpse at the cuts, Figs. 3 and 4, showing the details, the reader

mounted on a short, stout spindle within a casing of 4-inch pipe. This upright spindle is keyed into and forms a part of another lever below and on the outside, which projects in front of the rail. The lever at the rail is kept in position by a spring, as indicated. As the rails come along from the saws one after another, this lever is pushed outward and thus makes one contact for every rail. The simple arrangement by which a good rubbing contact is secured is so clearly illustrated that no further explanation is required.

The printing telegraph system illustrated by Figs. 5, 6, 7, 8 and 9 is, as a matter of course, more complicated than the counter. Its object is to print on a tape, at the finishing end of the mill, where the stamping machine is located, the heat numbers of the ingots, the ingot numbers, and the number of rails in each ingot, so that the proper heat and ingot

the numbers and letters as they are printed on the tape. The transmitter is operated by a man at the "pits," or reheating furnaces, at the further end of the mill, about 350 feet from the stamping machine.

To understand the details of this printing telegraph system it will be necessary to refer to the lettered parts in the diagrams and also to remember that two circuits are employed. It will be understood from Fig. 9 that while there are two circuits only three wires are needed, common return wire being used. From Fig. 7, in which is shown the transmitter with the dial face removed and also three sectional views, it will be seen that the transmitter consists essentially of a commutator ring C and a contact ring B, between which there may be revolved a contact lever A. The contact lever is shown more clearly to the left in the cut. This last named part

can be turned around in only one direction, any back motion being prevented by a ratchet wheel R. The part D of the contact maker bears against the inner face of the commutator ring C and as this arm A is directly connected with the battery (see

diagram of circuits, Fig. 9), a revolution of the crank over the segments send impulse after impulse of current to the receiver at the other end of the mill. These impulses act on magnet M, Fig. 8, and serve, by means of the lever escapement E,

to produce a synchronous movement of the type wheel T.

To make the impressions upon the tape, after the type wheel has been set by the impulses due to the movement of the little contact block D over the segmental face of C, the push button P in the transmitter, Fig. 7, is brought into play. When the crank has been moved around to a number or a set of letters on the dial, the button P is pushed in so as to make contact with ring B. As block D is at this moment in such a position that it is insulated by one of the segments of ebonite which are dovetailed into ring C, the contact between the crank and the other ring B serves to send current into magnet N of the receiver. Magnet N, lifting lever L, presses the tape up against the type and thus prints the symbol corresponding to the one on the dial to which the crank had been turned.

The upward movement of lever L serves also, by means of the escapement F, to move along the type into a position to receive another impression. The brass feed rollers H are actuated by the clock spring S. This spring is wound every 24 hours, and feeds out from 200 to 250 feet of tape. I is the ink roller. The tape is wound up on the spool W by the slipping belt V. It may be mentioned, too, that there is a "dog" to prevent backward motion, which would throw the type wheel out of synchronism relative to the crank A.

The rail counter was devised by H. S. Loud of the South Works of the Illinois Steel Company, and the printing telegraph was made after designs prepared by G. A. Trube, also of the South Works. For the photographs of the apparatus the *Western*

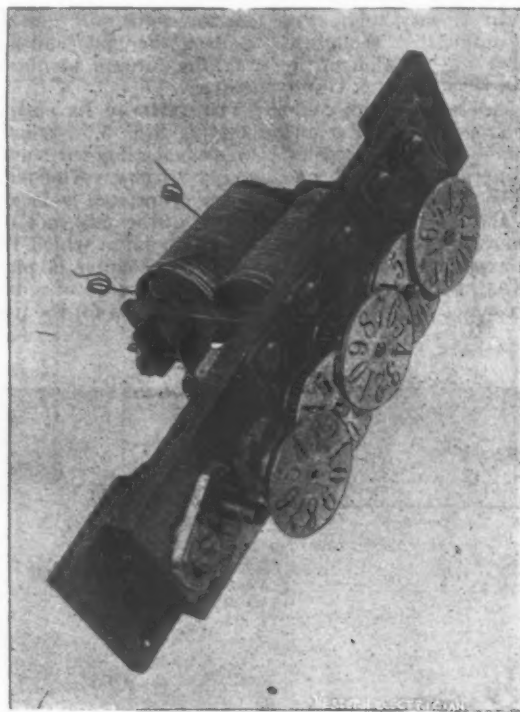


Fig. 2.—The Register.

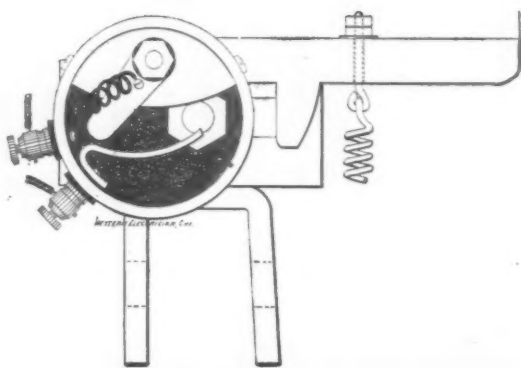


Fig. 3.—Details of Contact Maker.

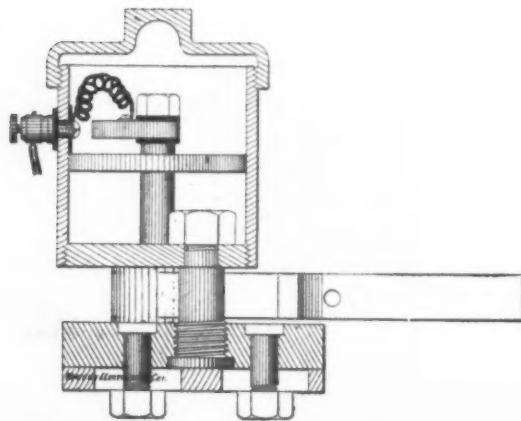


Fig. 4.—Details of Contact Maker.

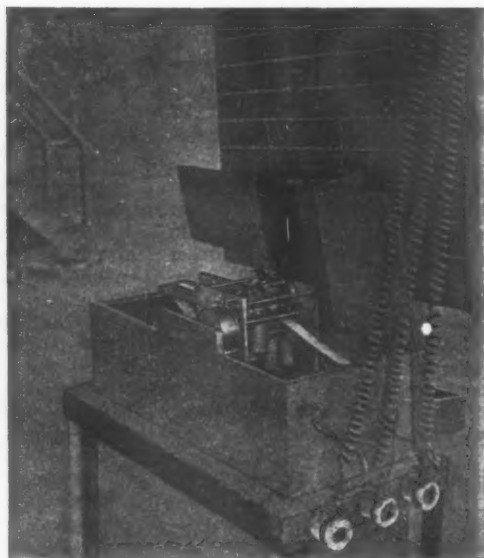


Fig. 5.—Receiver of Printing Telegraph System.

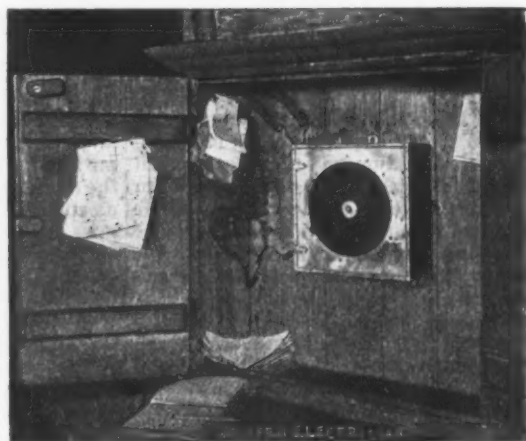


Fig. 6.—Transmitter.

Electrician is indebted to W. Clarke Catlin, assistant superintendent of the rail mill.

Treaty with San Domingo.

The new treaty between San Domingo and the United States took effect on the 1st inst., according to the terms of the

producers and manufacturers of the United States directly by a removal of burdens, but in many respects will give them a substantial advantage over foreign competitors for the Dominican trade. About one-half of that trade is with the United States; but the balance against this country, on a total of \$2,373,000 in 1890, exceeded \$1,000,000, while the balance was largely in favor of the United King-

dom, France and Germany. A reversal of that condition may now reasonably be expected. Taking the exports from this country to San Domingo last year as a basis, the following statement shows approximately the effect of the agreement. While the figures are not exact, they are believed to be sufficiently accurate for all practical purposes.

document published by President Henreaux on August 1. Merchants in that republic are looking for a large increase of importations from the United States as an immediate result. A Washington dispatch says:

The agreement removes entirely, so far as this country is concerned, the onerous duties hitherto imposed by San Domingo upon more than 38 per cent. of the export trade from the United States to that country, and reduces by 25 per cent. the duties imposed upon nearly 28 per cent. of that trade. It will not only benefit the

slate, tar paper and other materials for roofing, \$10,527; copper in bars, plates, nails and screws, and copper and lead pipe, \$1876; wire, plain or barbed; for fencing, with hooks, staples, nails, &c., and telegraph wire and telegraphic, telephonic and electric apparatus of all kinds for communication and illumination, \$11,501. Articles to be admitted at a reduction of 25 per cent. from existing rates of duty include manufactures of iron and steel, single or mixed, not made free of duty; tin plate and tinware, cordage, rope and twine of all kinds. The total

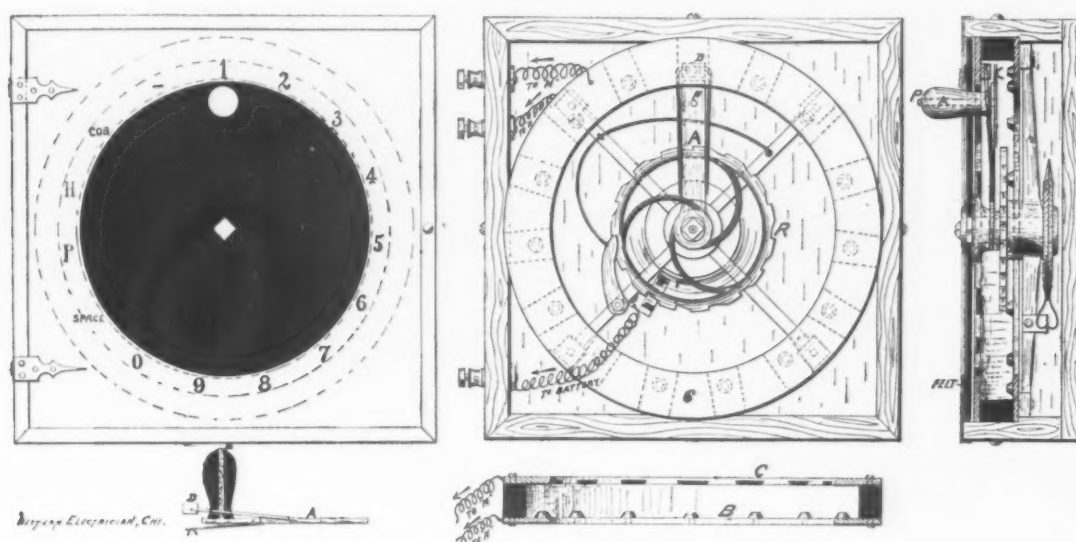


Fig. 7.—Details of Transmitter.

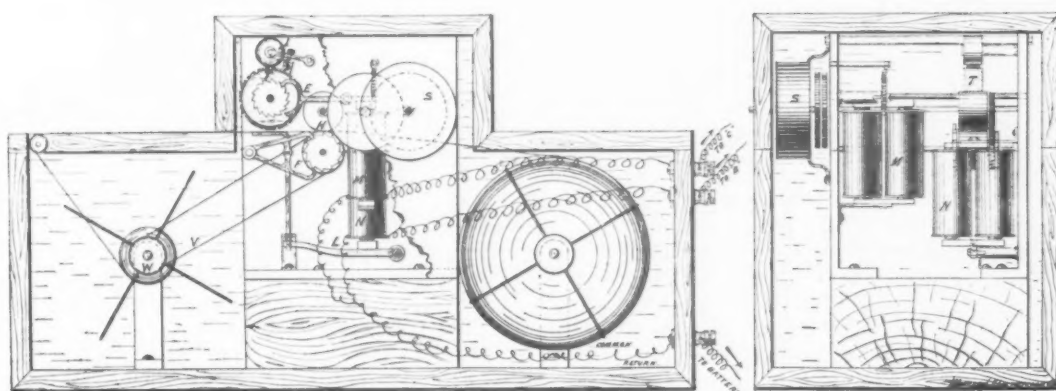


Fig. 8.—Printing Device.

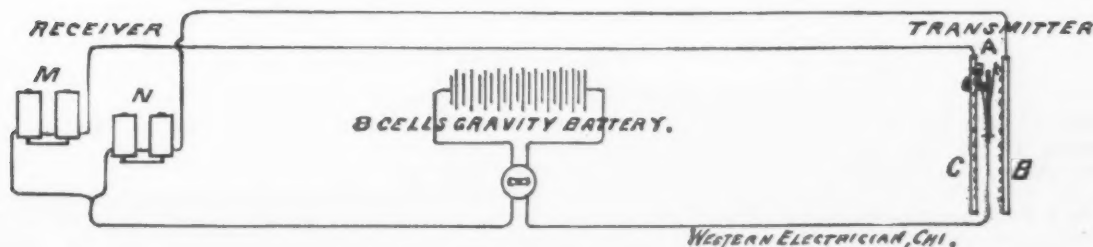


Fig. 9.—Diagram of Circuits.

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Among the articles made free of duty are: Agricultural implements, \$717; coal, \$3480; machines, including steam engines and those of all other kinds and parts of the same, implements and tools for agri-

slate, tar paper and other materials for roofing, \$10,527; copper in bars, plates, nails and screws, and copper and lead pipe, \$1876; wire, plain or barbed; for fencing, with hooks, staples, nails, &c., and telegraph wire and telegraphic, telephonic and electric apparatus of all kinds for communication and illumination, \$11,501. Articles to be admitted at a reduction of 25 per cent. from existing rates of duty include manufactures of iron and steel, single or mixed, not made free of duty; tin plate and tinware, cordage, rope and twine of all kinds. The total

value of exports to San Domingo from the United States last year was \$926,651. In preparation for the change the Dominican Consul at New York issued the following notice to shippers:

Shippers to any of the ports of the Dominican Republic are hereby respectfully notified that, in conformity with the terms of the commercial arrangement between the Dominican Republic and the United States of America, which will go into force on and after September 1, 1891, all invoices and bills of lading must be accompanied by a sworn declaration stating which are the merchandise of the production or manufacture of the United States, and which are of a foreign country.

The Kennedy Gas Regulating and Cut-Off Valve.

Hugh Kennedy of Sharpsburg, Pa., the well-known manager of the Isabella furnaces, has designed a gas regulating and

pipe shown is attached to a plate casting having holes registering with the openings of the pipe. This plate is set in another plate and is provided with a rack and pinion, as shown, by which it may be moved longitudinally. The whole is placed on top of the main flue, the partition wall in which is located between the two openings referred to. A shifting of the pipe and the plate to which it is attached enables the operator to cut off completely the connection between the two adjoining parts of the main flue.

An ingenious instrument, by means of which the profile of a river bed can be taken automatically from a boat at the rate of $3\frac{1}{4}$ to $6\frac{1}{2}$ miles an hour, has been invented by a German engineer, Mr. Stechner. The apparatus consists of a curved arm, which is hinged at its upper extremity, and is so long that the lower

of the Eiffel tower. He claims that the structure he has designed is more marvelous than Eiffel's famous tower. It will cost \$2,000,000.

The Liquefaction of Bessemer Steel.

H. Reuss of La Louvière, Belgium, reports to *Stahl und Eisen* a striking case of the liquefaction of steel. A roll weighing 7 tons was cast of Bessemer steel, bottom casting being used. From the edge of the last groove in the bearing the roll was conical, and the maximum section of the casting was at the base of this conical part, so that the steel remained liquid longest there. At this point there was a cavity of 3.9 by 5.9 inches, while the rest of the casting was sound and the head only showed blowholes. In the interior of this cavity on that part of its surface which pointed downward was attached a flat cake, 2 inches in diameter and 0.6 inches

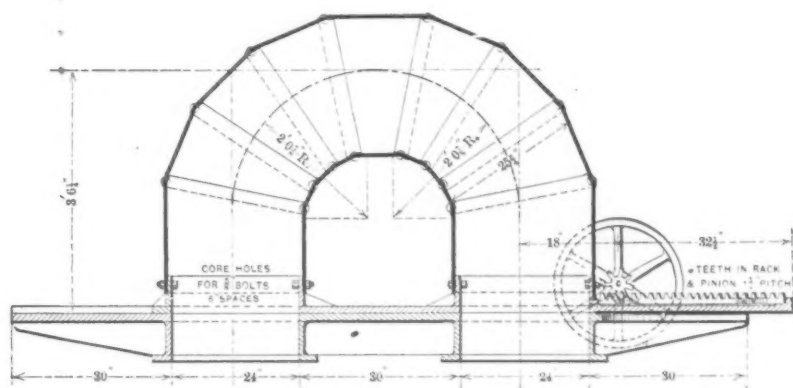


Fig. 1.—Vertical Section.

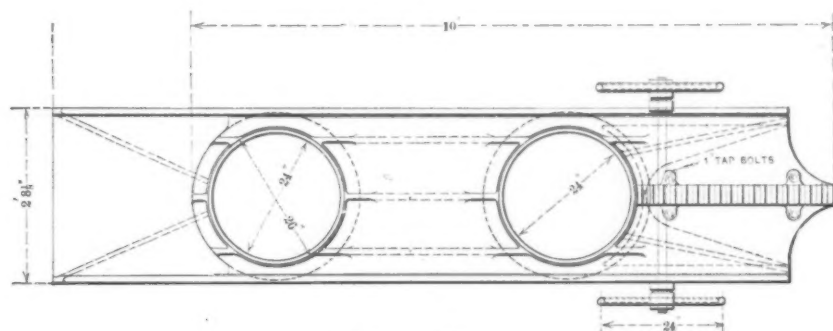


Fig. 2.—Plan.

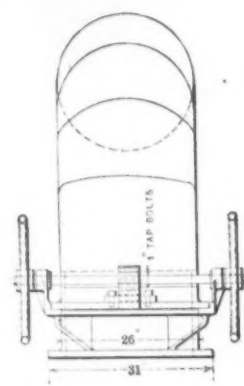


Fig. 3.—End Elevation.

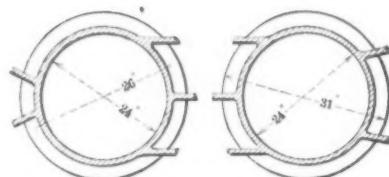


Fig. 4.—Horizontal Section.

THE KENNEDY BLAST FURNACE GAS REGULATING AND CUT-OFF VALVE.

cut-off valve which he has adopted at the new furnace. It has been found a very convenient arrangement, since one furnace may be cut off without stopping the others. In a furnace plant which comprises several furnaces, it has been found conducive to the regularity of work, to cause the gas from all the furnaces to discharge into one main flue from which the boilers and stoves are supplied. Valves have been placed in the main flue, in order to be able to cut it off from an individual furnace, so that the men can get access to parts where the presence of gas would be dangerous. Owing to the large size of the flues and the necessarily large dimensions of the valves it has been found difficult to shut off the gas perfectly.

Mr. Kennedy, instead of making the flue continuous divides it by cross walls into parts corresponding to the number of furnaces, and connects the adjacent parts with each other by removable pipe connections. The accompanying drawings show the device preferred. The U-shaped

curved portion trails on the bottom of the stream. Of course, the deeper the stream the greater the inclination of the arm, and hence, by a suitable recording mechanism, the depth can be automatically registered in a revolving drum as the boat proceeds on its course. The instrument has been practically tested on the Elbe, where soundings were made over a distance of 297 miles in ten days.

Mr. Eiffel's plans for a tower at Chicago were rejected by the committee in charge. The Frenchman wanted the directors to put down the foundations while he was getting out the superstructure. Then he would come to Chicago, and, standing on the lake shore at Jackson Park, with a yacht cap pulled down over his eyes, boss the job of putting the tower, together. E. F. Cragin and Mr. Hale, of Chicago, are ready to build a tower 1,076 feet high. They have plans drawn by George S. Morison, and are about ready to begin business. Mr. Morison went to Paris several months ago, and made a careful study

thick, nearly round. Its surface was entirely smooth, while the cavity walls near it were curved with irregular indentations and with crystals. The cake itself was but lightly attached to the wall of the cavity, and the whole had the appearance as though the cake had been formed much later than the cavity, and as though it were a more readily melted alloy which had been forced into the cavity while the balance of the mass contracted. The following analyses were made:

Sample taken from:	Carbon.	Silicon.	Phosphorus.	Sulphur.	Manganese.
Charge during casting	0.240	0.336	0.069	0.074	0.970
Upper bearing ...	0.215	0.338	n. d.	n. d.	0.910
Lower bearing...	0.314	0.280	n. d.	n. d.	0.980
Interior of roll 12 inches below cavity.....	0.309	0.252	0.079	0.055	0.960
Surface of cavity to which cake was attached...	0.680	0.326	0.318	0.325	1.490
Cake itself.....	1.374	0.410	0.753	0.418	1.066

Roughing Train and Doubling Machine for a Tin-Plate Mill.

Theodore L. Thomas, an experienced tin plate worker, now connected in another capacity with the Union Works of the Illinois Steel Company, Chicago, furnishes us with some details of a mill which he has designed for rolling tin-plate bars. The mill is herewith illustrated, Fig. 1 showing side elevation and Fig. 2 the ground plan. Mr. Thomas has also devised a doubling machine, likewise shown in the illustrations, which he deems an important part of the apparatus. This mill is intended to break down tin plate

(four) fours, (five) eights, finishing to suitable lengths. The description applies to what is known in the market as IC 20 x 14. By Mr. Thomas's method a 14-inch bar is taken. It is heated, passed through the lower rolls in the direction of the arrow, shown in Fig. 1, and then back through the upper rolls. The rolls are carefully adjusted by lining, graduating the work on the bar throughout the six passes. Guide rollers between the rolls keep the bar in proper position for the next rolls. The rolls are a sufficient distance apart to prevent buckling. The sheet which emerges from the last pass is trailed on the floor a little on one side of the doubling

Thomas claims that with his improved mill enough iron or steel can be molded and doubled to keep four finishing mills at work. For example, he says, four ordinary mills will turn out 2000 boxes per week, while with his mill and doubling machine they can make 3000 boxes per week at a low estimate. He further states that skilled help is not required except in the case of the roller and heater, boys being capable of doing the balance of the work, making the labor cost at least 20 per cent. less than by the old method. In making IX sheets or heavier the gain of output would be more than above stated, since IX or thicker sheets are finished on fours. The

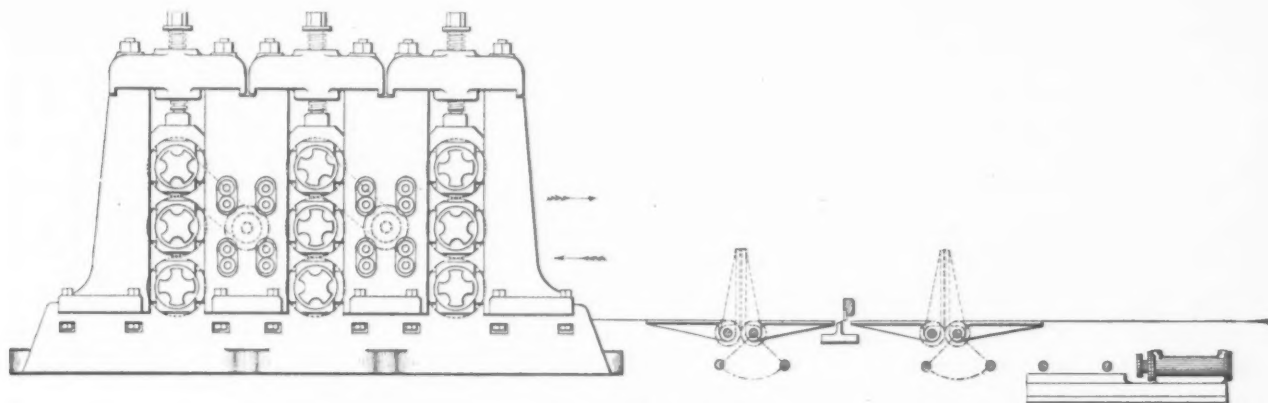


Fig. 1.—Side Elevation.

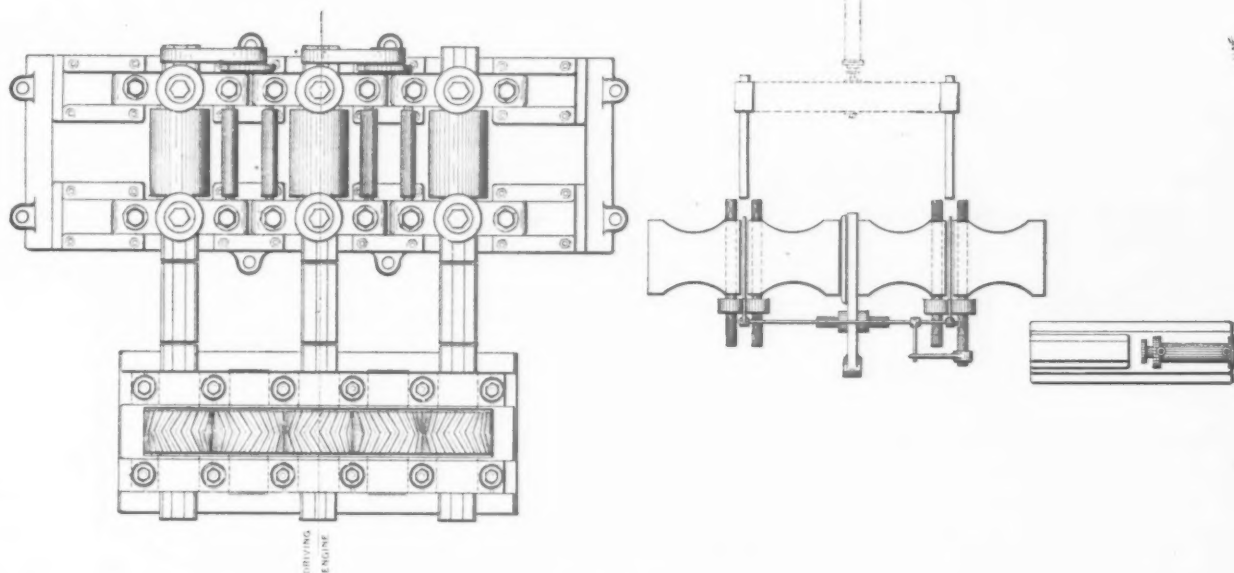


Fig. 2.—Plan.

THE THOMAS ROUGHING TRAIN AND DOUBLING MACHINE FOR TIN-PLATE MILL

bars and prepare them for the usual finishing train. It consists of three sets of rolls, three high, inclosed in one pair of housings and driven by one engine, as indicated by the gearing. The doubling machine, on which application has been made for a patent, consists of four folding doors lying at floor level, with shears in the center.

The special features of this mill and doubling machine may be more perfectly comprehended by an explanation of the usual method of making sheets for the tinning process. The practice at present followed, as described by Mr. Thomas, is to take a 7-inch bar, cut to suitable width. It is subjected to five heatings and five rollings, with four doublings. The five rollings are known to millmen as (one) molding, (two) singling, (three) doubling,

machine. It is then pushed by machinery on the folding doors and into the shears, which cut it in two. The doors next move into a perpendicular position, thus doubling the two sheets at one operation and one heat. The doubling machine is intended to be operated by hydraulic or steam cylinders, the valves or levers being placed within easy reach of a boy who stands at one side of the machine.

Mr. Thomas states that two-fifths of the work of rolling the black sheets is performed at this stage, leaving three-fifths to be done in the finishing mill, to which the doubled sheets are taken by an endless chain or other labor-saving device. The finishing mill being thus relieved of two-fifths of the work of rolling the black sheets, can be operated with much greater capacity than by the old method. Mr.

yield of sheet would also be considerably improved by making less scrap, as by cutting the sheet in two there is only one long piece of scrap made instead of two pieces. Fuel would further be economized, because this mill molds and singles at the same heat.

A shingle machine has been devised that cuts 170 strokes a minute, a heavy knife throwing off the shingles more rapidly than they can be counted.

The German iron and steel manufacturers who visited this country last year have sent to the representatives of the different local committees a very artistic address of thanks. About 50 Americans were the recipients.

The Barrett Cylinder Boring Machine.

A new cylinder boring machine, made by the Barrett Vise and Tool Company, of Meadville, Pa., is here illustrated. It is adapted to bore and face engine cylinders, boring guides, piston-rod hole and stuffing box, and facing ends of the frame—in fact, all places where a true and smooth bore and face are required.

It has a heavy bed, 6 feet long, 26 inches wide, by 10 inches deep. The boxes on the frame are 11-inch bearing, bored $6\frac{1}{2}$ inches, in which sleeves are fitted. The bar fits in the sleeve, and in it a key-seat is cut to fit the key in the sleeves. The sleeves revolve in the boxes and the bar slides through the sleeves. By this arrangement the wear is reduced to a minimum. Attached to the sleeves are facing blocks, which are moved by a star feed that can be set to feed in or out by moving a trip, and the bar is driven by worm and worm gear, geared 31 to 1; this is a powerful feed, gives a steady movement and is noiseless. The driving shaft is steel, $2\frac{3}{8}$ inches diameter, running in the boxes each 7-inch bearing. The end of the shaft is hardened. In the outside bearing there is a steel step to take the

mered steel, 5 inches in diameter. All racks and pinions are cut from the solid. Floor space, 6 feet by 26 inches; extended frame, 4 feet; speed of countershaft, 150 revolutions.

The Effect of Temperature on the Strength of Railroad Axles.

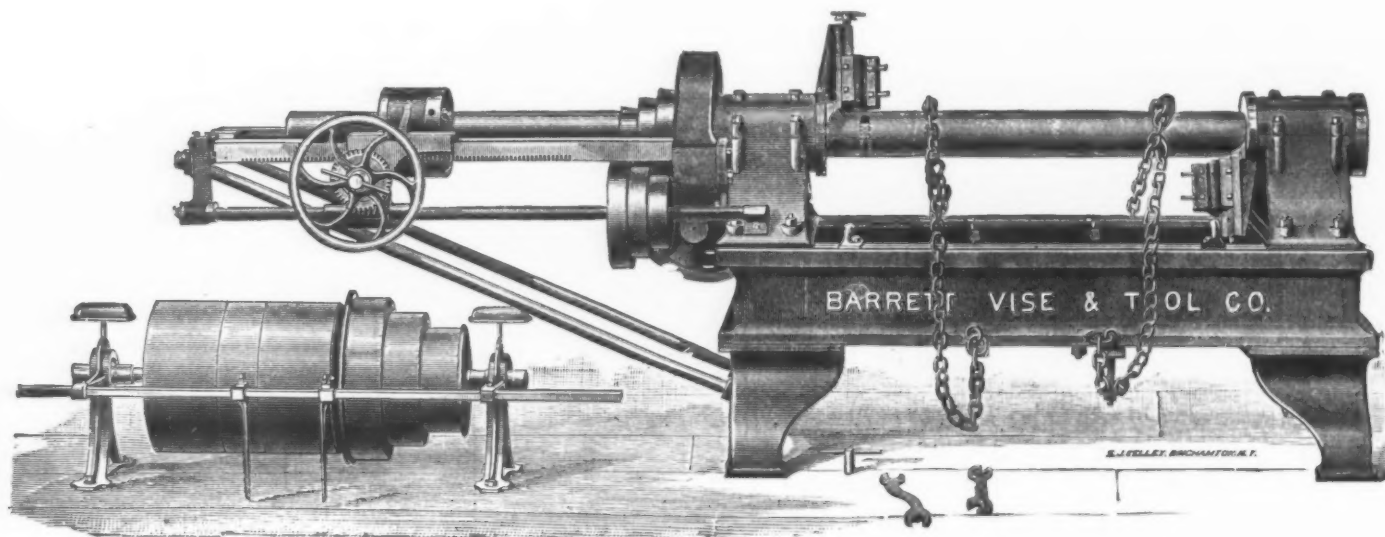
Thomas Andrews has undertaken an investigation in order to determine by experiments on a large scale the resistance of metals to sudden concussion at varying temperatures down to 0° F., and at the same time to ascertain, if possible, some of the causes leading to accidental fractures on railways. The investigation has extended over nearly seven years, and the results obtained have from time to time been published in the "Minutes of Proceedings of the Institution of Civil Engineers of Great Britain," and include also a paper on "The Effects of Chilling on the Impact Resistance of Metals." It may be desirable to give a brief *résumé* of the whole series of observations made in connection with Parts I, II and III of the research. The following are the author's general tentative conclusions:

at the higher temperature of nearly 88 per cent.

The author has also found that when axles were subjected to a number of heavy blows, the extent of the deflection was more during the earlier blows under some temperature conditions than the deflections produced by the later blows—i.e., the elastic limit of the axles had risen. This progressive decrease of deflection was manifest with the impacts made at the temperatures of 212° F., 120° F., and 100° F., but it was not observable when the axles were at a temperature of 0° F.

The experiments on the "Effect of Chilling on the Impact Resistance of Metals" were of a different nature, and are consequently scarcely comparable with the above results. Among other things, however, they showed that a reduction of the impact resistance of metals results from even a single lowering of the temperature through 100° F., more extensive chilling producing a considerable reduction of resistance to impact.

In the course of the research allusion has been made to alternating changes of temperature in axles owing to journal friction and the effect of this in inducing fracture.



THE BARRETT CYLINDER BORING MACHINE.

thrust of the shaft. The cone pulley on the driver shaft has three steps, $4\frac{1}{2}$ wide by $10\frac{1}{2}$, $13\frac{1}{2}$ and $16\frac{1}{2}$ inches in diameter. To the handle bar there is an extended frame, well supported, on which a cross-head slides; this crosshead carries a sleeve that revolves in the crosshead; in the sleeves there is a key or feather that fits the key-seat in the bar, and is tightened by the set screw in the sleeve. By this arrangement the bar can be handled at will. The feed is a rod feed, commonly used on lathes. On the main sleeve there is a cone pulley with three steps and one shaft running parallel with extending frame; there is another cone pulley which drives the shaft. On the shaft there is a worm, held in position by the apron attached to the crosshead; this worm drives a worm gear on the shaft running through the crosshead on the crosshead shaft. There are pinions working in a rack cut in the extended frame, also a hand wheel fastened by a feather that can be locked to the worm gear by friction when desired. The changes of feed are $\frac{1}{16}$, $\frac{1}{8}$ and $\frac{1}{4}$ inch. The length between facing blocks is 3 feet, and the machine will face 28 inches outside diameter. There is a chuck for holding the cylinder, and if it is desired to face the head or bore the stuffing box and guides the outside box can be removed. The bar is of ham-

1. The impact tests with an "energy" of 10 foot tons on axles at a temperature of 212° F., compared with results at 7° F., indicated an increase of endurance at the higher temperature of about 235 per cent.

2. The impact tests with an "energy" of 15 foot tons on axles at a temperature of 120° F., compared with results at 7° F., showed an increase of endurance at the higher temperature of nearly 120 per cent.

3. The impact tests with an "energy" of 10 foot tons on axles examined at a temperature of 100° F., when contrasted with results obtained at 7° F., demonstrated an increase of resistance at the higher temperature of about 43 per cent., and this increase was, within certain limits, in proportion to the increase of temperature.

4. The impact tests with an "energy" of 5 foot tons on axles at a temperature of 100° F. gave an increase of resistance of about 138 per cent. compared with the results on axles similarly tested, but at a temperature of 0° F.

5. The impact experiments with an "energy" of $2\frac{1}{2}$ foot tons, applied to axles at a temperature of 100° F., compared with experiments at 0° F., showed an increased resisting power to concussion

It has also been indicated that repeated concussions increase the rigidity of both steel and iron axles and tend to induce brittleness in the metal.

Careful determinations with delicate apparatus have also been made of the heat dilatations of railway axles at varying temperatures from 0° F., 100° F., 212° F., 392° F. and 572° F., and the detailed results have been given in the former parts of this paper. It was observed that large forgings, such as railway axles, expanded somewhat unequally in different directions, owing to the diversified molecular structure of the forged metal. It was ascertained that wrought-iron axles generally show premonitory signs of destruction previous to final fracture, whereas steel ones appear to break suddenly without previous warning.

Full-sized photographs of most of the 286 fractures have been taken, so as to preserve accurate records of the comparative aspects of fractures occurring at different temperatures. Some of these are reproduced in the papers by the author published in the "Minutes of Proceedings," and a complete series of the original photographs, in volume form, has been presented by the author to the library of the institution for reference. The appearance of the fractures of the warm tests was found to be of a fibrous

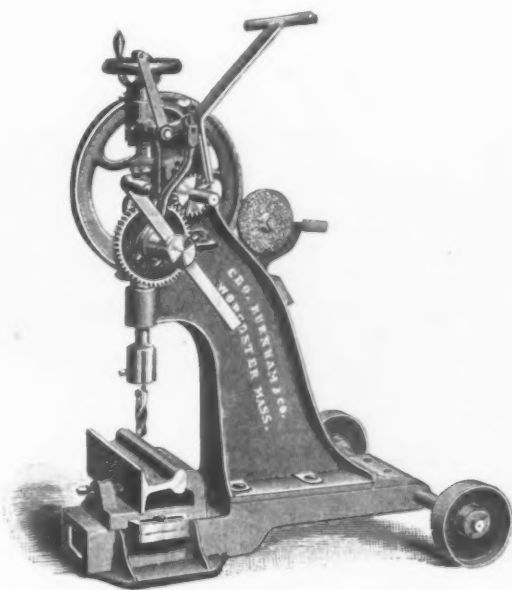
character, those of the cold tests having a more fine-grained and crystalline aspect.

It will have been observed that the different sets of experiments were made under varied conditions both of temperature and force of impact, &c., which probably accounts for the somewhat diversified comparative percentages obtained. The results of each set are, however, comparable with themselves.

The author's conclusions receive confirmation from the recent experiments made in Sweden by C. P. Sandberg, Assoc. M. Inst. C. E., showing the effect of low temperature on the strength of wrought-iron and steel rails. Mr. Sandberg found that the resistance of steel rails to impact was considerably reduced at low temperatures, and this is also in accord with the author's experience.

The Burnham Portable Railroad Drill.

A drilling machine designed for general use about railroad yards or in the construction of new roads, and also applicable to bridge and structural work, has



NEW PORTABLE RAILROAD DRILL.

been introduced by George Burnham & Co. of Worcester, Mass. It is intended to do the work usually performed by a ratchet drill. It can be used as a bench drill by removing it from its base and bolting it to a bench. It has automatic feed, adjustable to four changes. By putting the crank on the balance wheel shaft the power is increased two to one. It is provided with a grinding attachment for keeping the drills sharp; this will be found to be of great value, as it provides means for always keeping the cutting tools in proper condition.

The emery wheel has 17 revolutions to the crank's one, and is brought in contact with the balance wheel by simply turning a thumb nut. The spindle has a run of 4 inches and the drill socket takes $\frac{1}{4}$ shank drill. The drill socket can be removed and one of any other size shank, or a universal chuck, put in its place. The chuck for holding the rails can be removed and the drill used on a general line of work. It will drill from 0 to $1\frac{1}{4}$ inches to the center of a 12-inch circle. The trucks are 6 inches in diameter and $2\frac{1}{4}$ inches in face. The machine is strong enough to do all the drilling about a railroad yard, and by means of the trucks it can be moved about with ease. The weight is 200 pounds.

The St. Paul Railroad Report.

President Roswell Miller of the Chicago, Milwaukee and St. Paul Railroad takes occasion to make some very pointed remarks, intended for the general public, in connection with the twenty-seventh annual report of his company, which has just been published. The report shows gross earnings for the fiscal year ending June 30 of \$27,504,224.49, and net earnings of \$9,471,931.82. As compared with the previous year, gross earnings increased \$1,098,516.14, while net earnings decreased \$94,886.14. Commenting upon this financial showing, President Miller says:

It is an unavoidable conclusion that when so large an increase of gross earnings produces no increase of net revenue the rates obtained for transportation are too low. This conclusion is often met by the assertion that existing rates would be sufficient for all needs, if they were maintained. It seems idle to prescribe maintenance of rates in view of the fact that legislation has prohibited pooling—the only satisfactory method of providing for the necessities of railways whose disadvantages prevent them from competing on equal terms with railways that are more favorably situated, and the only efficient means of restraining within safe bounds

put in. This has resulted from the anticipation of the needs of the country, for which the public is as much responsible as investors, and from which the public has reaped the principal benefit. The development of the country has been hastened, and the farmer finds that land for which he paid \$5 per acre is now worth \$30, because there is a railway to haul his products to market, while the owner of railway property finds it a constant struggle to save his original investment.

The principal lines of railway in the West cannot be duplicated for their present capitalization. This is the material point. There seems to be no good reason why the owners of a railway which it would cost more than its present capitalization to duplicate should be deprived of the right to a fair return on the value of its physical property, any more in the case of railway property than in the case of mills, or farms, or factories, or newspapers or any other property; nor should owners of railway property be denied all benefit from appreciation of value, while owners of other forms of property have the benefit of an appreciation to which railways have contributed no small part.

Increase in Wages.

A constant pressure has resulted in a considerable advance in wages, without a corresponding increase in net revenue. It is impossible that a liberal standard of wages can long be maintained unless the capital which sustains the enterprises in which labor is employed is permitted also to receive a liberal compensation for its use. This conclusion concerns not only labor directly employed by railways, but the many other commercial and industrial interests which absorb the wages of railway labor, or employ the multitude of workmen who are engaged in the production of the enormous amount of supplies and material which railways consume—the cost of which consists principally of wages paid for labor in production. The difference between the value of iron in the ground and in a rail, or of a tree in the forest and in lumber, or of coal in the mine and on the tender of a locomotive, is mostly labor.

The railways, directly and indirectly, are the largest employers of labor, and labor has more interest in their welfare than capital. It is not unreasonable, therefore, to expect that the element of labor, which ambitious politicians are so eager to propitiate, will with a more intelligent appreciation of its own interests exercise in time a strong influence in securing legislative action relative to railways which shall be dictated by a just regard for the welfare of so important an interest.

The payments of this company for labor directly employed in its service during the last year were \$12,463,362, and for materials and supplies \$6,955,777, of which at least 75 per cent, or \$5,216,832, was for labor in production, making a total of \$17,680,195 expended for labor. Nearly all of this sum is distributed among the sellers of merchandise, food products and fuel, so that the larger part of payments for transportation goes directly back to the sources from which it came. Whoever takes the narrow view that, because he owns no railway stock, it is no concern of his whether anything is paid on the stock is about as sensible as the man who, because he owns no farm and grows no corn, thinks it no concern of his if the corn crop is a failure. The same nerve runs through all commercial and industrial interests, and most of the errors of railway legislation have sprung from the assumption that one can be injured without detriment to the others.

Net Earnings Too Low.

Another important element is beginning to interest the public in the necessity for an increase in the net revenue of railways. The development of the country and consequent increase of commerce demand more and better facilities and a higher standard of railway property. How can these be furnished unless the net income of railways is increased? If railway companies are not permitted to earn enough to pay for improving their property, they must borrow; and how can they borrow unless they can show a reasonable certainty of enough net earnings to pay for borrowed money? It is not sufficient to earn merely enough to pay interest on mortgages. No company can obtain money on favorable terms if for a long time it can pay nothing to its stockholders. It is a very easy matter for legislatures or boards of railway commissioners to legislate that a railway company shall expend \$1,000,000 in equipping freight cars with air brakes or in building viaducts over street crossings, but neither legislatures, nor commissioners, nor railway companies themselves can provide the means to meet the cost when earnings are insufficient to furnish good credit.

It is apparent that the railways of the West cannot meet such demands without a very

the destructive competition that results from the existence of too many competitors.

Maintenance of rates will not relieve American railways from the disastrous effects of the competition of foreign railways, for legislation has tied up American railways and leaves foreign railways free to carry off their traffic. American railways are compelled either to reduce through rates, under penalty of probably reducing intermediate rates, or pay subsidies to foreign railways or lose the traffic. Maintenance of rates will not cure the evil effects of the unremitting efforts of State authorities to reduce local tariffs. In view of these conditions it is not surprising that the efforts made by railway managements to maintain rates have not been fully successful, but that they should have even a moderate or spasmodic success is surprising, when all the conditions have been adverse.

Railroads Not Overcapitalized.

It is not often asserted that present rates would be sufficient to meet all needs if the companies were not overcapitalized, but it can hardly be demonstrated that the principal lines of railway in the West are overcapitalized, or even that their capitalization represents as much as the present value of their physical property. It is not material whether the present owners have paid dollar for dollar for their interest in the railways, for the history of railways in the West shows that more actual money has been put into them than is now represented in their capitalization. If in some cases individuals have taken out more than they have put in, in more cases other individuals have hopelessly buried all they have

considerable increase in their capitalization. The proper way to accomplish this is to make the shares of the companies a safe and sure investment, so that they can raise money by sale of shares instead of sale of bonds. While it is a proper subject for the care of legislatures and courts that such increase of capital shall be represented by additional property and facilities, it is vital that equal care shall be taken that the revenues of the companies shall protect the increased capitalization, and prevent the disaster that will surely result from expenditure that cannot be made remunerative. It is an impossibility that increased capitalization shall represent only actual additions to property if its rates and revenues do not enable a company to place its bonds and stock at par.

The necessity for more and better facilities and a higher standard of railway property should, therefore, produce an enlightened and liberal view as to rates of transportation and the regulation of railways, for upon them depends the fulfillment of the public needs.

The Rollason Gas Engine.

The gas engine of which we here present engravings is the invention of Arthur

The engine is of the three-cycle type. Supposing an explosion to have just taken place, the piston makes a forward stroke under its impulse; the exhaust valve is then opened, and the piston returns, expelling a large proportion of the products of combustion. During the next stroke forward the piston draws in behind it a scavenger charge of air, which it forces out on the back stroke. On the fifth stroke a combustible charge of gas and air is drawn in, and on the sixth it is compressed ready for igniting, thus completing the cycle, which includes an explosion every sixth stroke, except when the engine is working at very low powers.

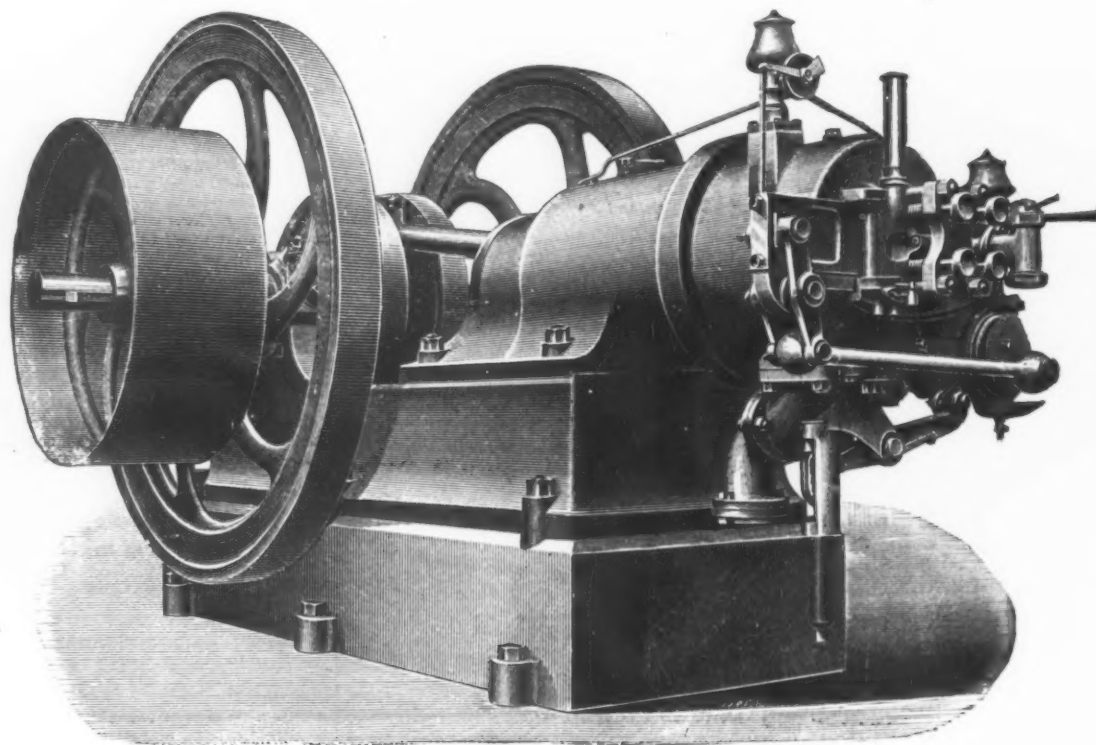
Referring to the engravings, it will be seen that the engine conforms in general appearance to the usual type. The connecting rod is pivoted directly to the piston, which has a guiding trunk. The cylinder is surrounded with a water jacket, which extends round the combustion chamber up to the rear valve face. The chamber itself is isolated from the influence of the jacket by an annular space,

the governor, its principal object being to enable the engine to be slowed down when not actually doing work.

When combustible mixture is to be admitted to the cylinder, the valve ports coincide with admission, gas and air inlets, the gas valve is opened and the charge flows in, following the outward movement of the piston. The first portion of the combustible gases taken in flows down the center of the cylinder until the piston stops, and then it divides and flows back along the walls. This portion, which is diluted with the air in the combustion chamber, is congregated round the firing port, while the richer part of the charge is situated next the piston. The weaker part is ignited first, and the velocity of combustion increases as it approaches the richer part.

Tests.

A. B. W. Kennedy, professor of engineering, University College, London, made exhaustive tests of this engine of 4 horse-power. Although the engine had



THE ROLLASON GAS ENGINE.

Rollason of Newcastle-on-Tyne, England. It has been in use in that country for two or three years with the most satisfactory results, proving itself to be economical in the use of gas, free from any tendency to be clogged by the products of combustion and to be reliable and perfect in operation under varying conditions. It is now being introduced in this country by the Electric Mfg. and Gas Engine Company, whose works are at Greenbush, N. Y., and offices and warerooms at 134 Liberty street, New York City.

These engines run at speeds varying from 100 to 250 revolutions per minute and work with a dilute or strong mixture of gas and air according to the varying load or requirements of work from the engine. They differ from other gas engines in the method of mixing the gaseous charge previous to ignition, and the burning of the mixture in a chamber which is heated and maintained at a high temperature. The entire absence of premature explosion and the complete expulsion of the products of combustion are points of advantage.

which is filled with a non-conductor. A side shaft, revolving at one-third the rate of the crankshaft, works the slide valve at the back of the cylinder by means of a connecting rod and a rocking beam. The slide valve is shown in the horizontal section in Fig. 4. This slide valve is formed with ports through which the supply of air and gas is admitted. The gas valve is raised at the proper instant by a cam, which is shaped to proportion the influx of gas to the speed of the piston. The amount of gas admitted is regulated by the governor, which is driven by the side shaft. The governor is connected by a rod to the valve, and as it rises it throttles the supply of gas to make it correspond with the work to be done. When the dilution of the charge has been carried as far as is economical, the gas is cut off entirely. A second lever connected with the governor carries a counterweight, and by altering the position of this weight the speed of the engine can be varied. This lever can be readily put in or out of connection with

but just left the erecting shop it ran smoothly and developed no weakness whatever. Professor Kennedy in his report said: "It ran continuously and smoothly, without the least hitch, and without (to the best of my belief) a single back ignition or misfire, during the whole five and a half hours of the trial, and the last half of the trial was even (although only to a very small extent) more economical than the first half, the last quarter of an hour happening to be nearly the most economical quarter of an hour during the whole test. During the whole time it worked with an excessively dilute mixture, and (comparatively) very low combustion temperatures. As to its gas economy, I may say that, so far as I know, no gas engine of the same size as this one has ever shown so small a gas consumption on a trial anything like so severe and protracted as that to which I put the Beck engine. I attach very little value to such short trials as have often been published, for on a short trial it is comparatively easy to register a small gas consumption. But even on the short trials of half an hour

and an hour, of which many have been published from time to time, I do not know of any trustworthy ones, made by uninterested persons, showing so small a gas consumption in so small an engine. The mechanical efficiency of the engine, or ratio of useful to indicated work, is also extremely good—quite above the average for an engine of this power.”

The rights of “walking delegates” are likely to be more clearly defined by the trial of a case which has been sent to the Grand Jury by Judge Frost, in Boston, the first of its kind brought before any court in that city. In consequence of the threats of Sullivan, a walking delegate, Michael Welch, a hod carrier, was discharged by the contractor who was erecting some buildings. Welch then applied to the court for a warrant for the arrest of Sullivan. The defendant Sullivan, in his testimony, denied that there were any threats or intimidations, simply claiming that as a walking delegate it was his duty to visit the different jobs in the city and notify contractors that no member of the union should work with any of the expelled members. Sullivan denied that he ordered a strike, as that was a matter that rested with the men themselves. Judge Frost ordered the defendant Sullivan to furnish bail for his appearance in the Superior Criminal Court the first Monday in September.

A silica sand of special excellence for use in making open-hearth and crucible steel castings has been found at Downer, N. J. The sand has been thoroughly tested and approved at some of the largest steel plants, and to facilitate shipments W. A. Downer, the owner of the tract, has had a railroad siding constructed, so that prompt and regular shipments can be made at any season of the year.

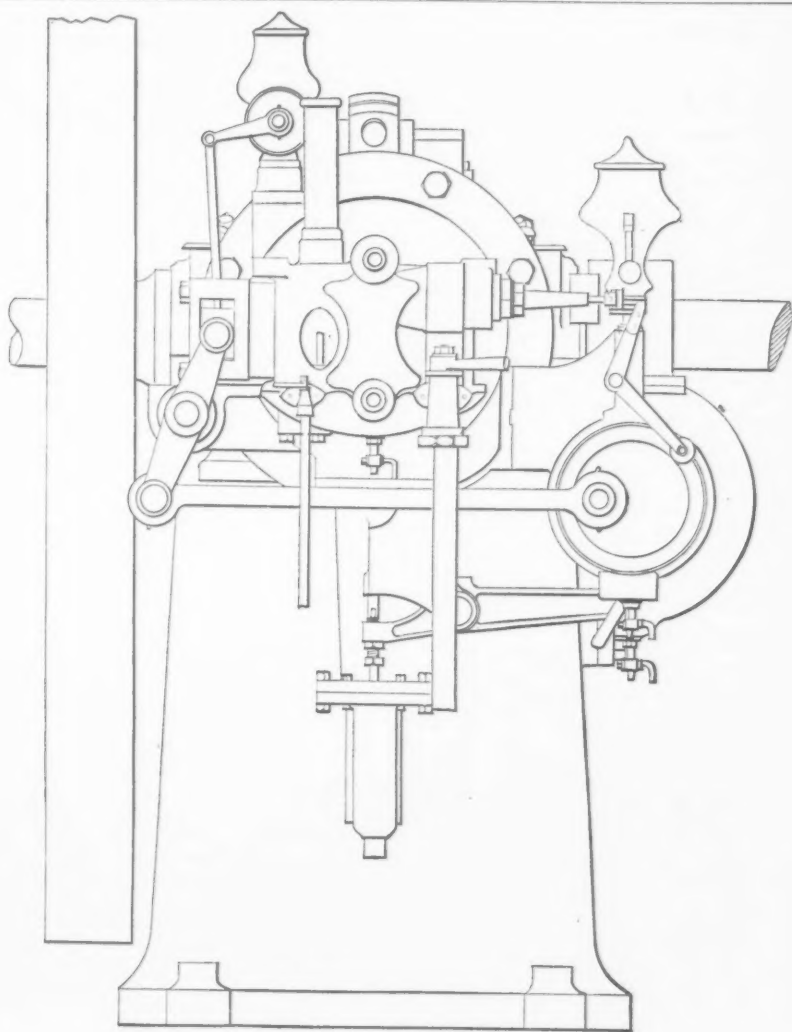


Fig. 2.—End Elevation.

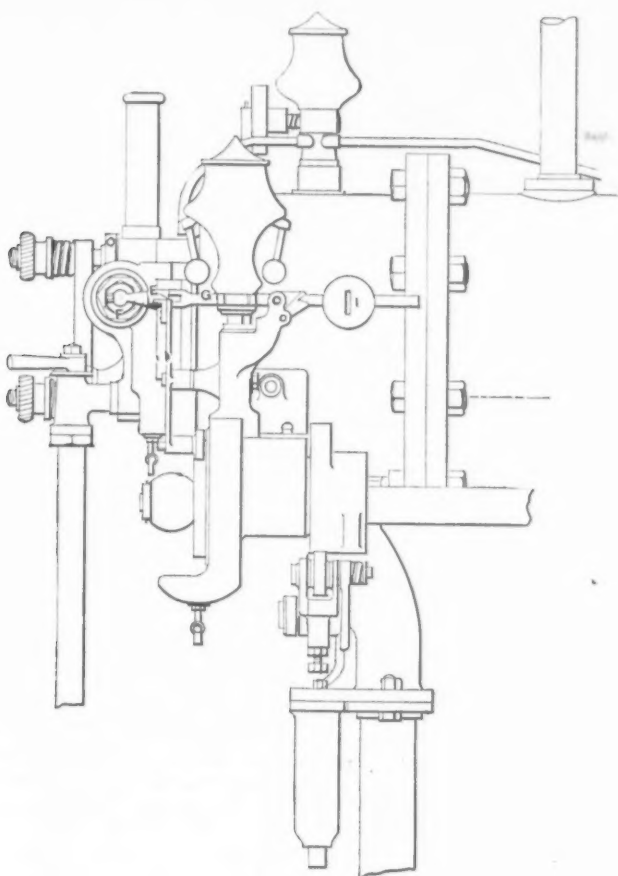


Fig. 3.—Part Side Elevation.

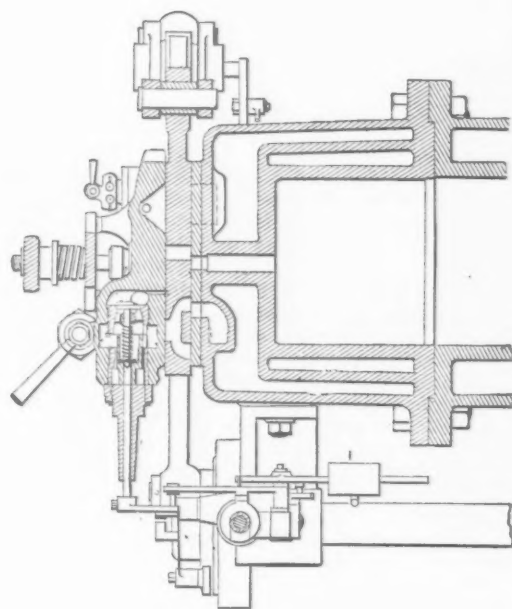


Fig. 4.—Horizontal Section.

Government Tests of Coil Boilers.

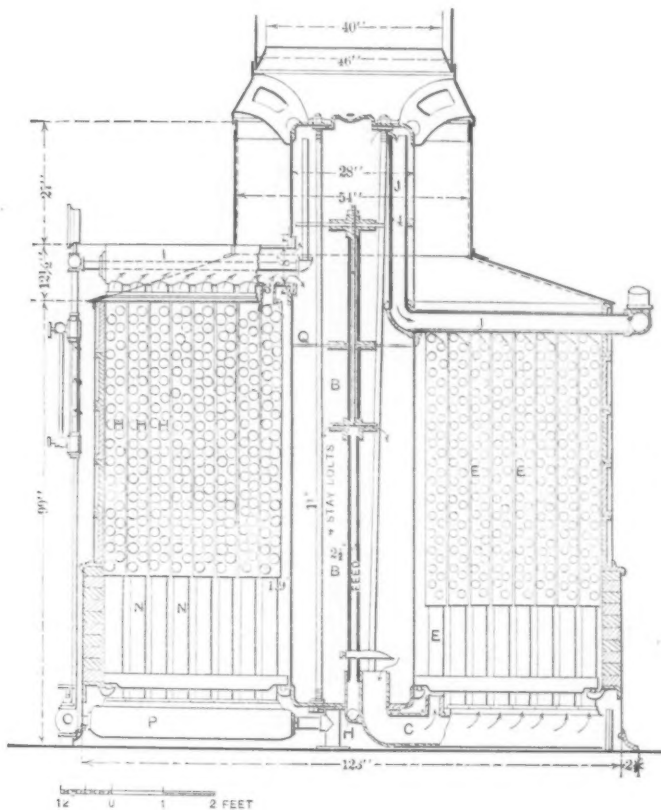
The report of Geo. W. Melville, chief of Bureau of Steam Engineering, just issued, contains an account of tests of two coil boilers, one made by William Cowles of New York and the other by Charles Ward of Charleston, W. Va. The tests were conducted by a board composed of Charles H. Loring, chief engineer, United States Navy, president; Geo. W. Roche, chief engineer, United States Navy; Geo. W. Magee, chief engineer, United States Navy, and J. J. Barry, passed-assistant engineer, United States Navy. These tests are of unusual interest, because, to quote the report, "the results obtained are of the greatest value not only to the service, but to the engineering world as well, since they were the most severe and the

type in the Monterey, as they best filled all the conditions required, and a contract has been made for them.

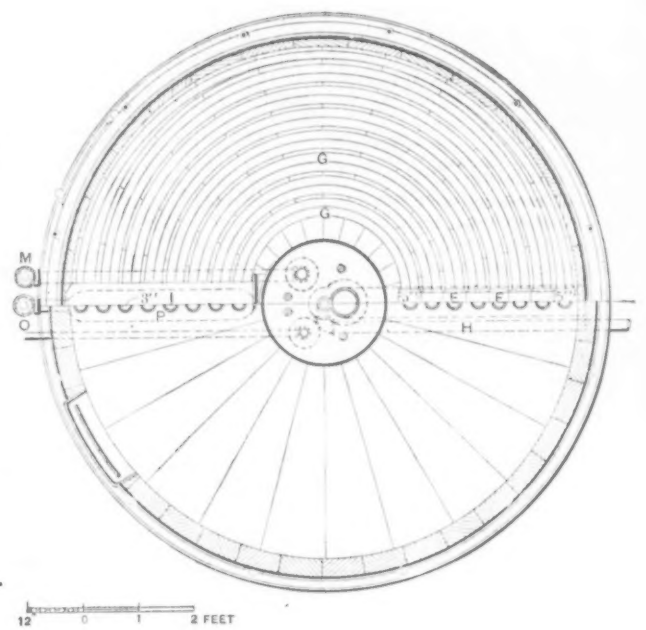
The decrease in weight for a given power is but one of the advantages to be gained from the use of coil or tubulous boilers, though this alone would warrant their being used. Another and very important advantage in favor of employing them in war ships is that from the small quantity of water they contain and the perfect circulation, steam can be raised in a coil boiler, without injury, in a very much less time than in one of the locomotive or Scotch type, even though the latter be fitted with mechanical devices for forcing the circulation. With a coil boiler all the time necessary is that required to start and build up the fire, say half an hour, with soft or semi-bituminous coal. This point was kept steadily in view when

ages to a vessel in any part of the world; arrived at their destination, the old coil boilers (if the ship is so fitted) can be taken to pieces and hoisted up the fire-room hatch, and the new ones lowered and connected together, all by the force on board. They can be forced with greater safety than can a shell boiler, since in a properly designed coil boiler the circulation of water will increase with the intensity of the fire, and if steam is washed off a heating surface as soon as it is formed no overheating nor burning can occur. A serious explosion with this type of boiler is impossible.

The use of boilers of the coil type in vessels of small displacement and enormously large power, like torpedo boats and cruisers, is already a necessity, and, in my opinion, it will not be many years before their use will be general in all steam



The Ward Coil Boiler.—Vertical Section.



Sectional Plan.

GOVERNMENT TESTS OF COIL BOILERS.

most carefully made of any of which we have knowledge, and have established a standard which future boilers must equal or surpass to be considered."

We take the following data from the report: Both boilers were given two trials of 12 hours each under forced draft, the air pressure being equal to 2 inches of water. One boiler was set up in a compartment to represent a closed fire room and the other was fitted for closed ash pit draft, the choice of methods being left to the maker. During the trials frequent observations were made of the dryness of the steam as well as of the various temperatures and quantities usually noted in boiler tests; and it is believed that nothing was omitted that could in any way have added to the accuracy of the results obtained or to the completeness of the information to be derived from them. Not only the steaming qualities of the boilers, but also the facility with which repairs could be made to them, in a space representing the fire room of a ship, was determined. As a result of these trials, it was determined to place boilers of the Ward

type for three-fourths the power of the Monterey, for the service she is to perform (coast defense) will require her to be ordinarily at anchor or under easy steam; if she is under way, with the two Scotch boilers with which she is provided in use, she can attain a speed of about 10 knots; this can be increased to 16 in a half hour by firing up on her coil boilers. Or if she is at anchor with no steam at all, or only sufficient to run the dynamo engine and other auxiliaries in constant use on a modern ship, she can in an emergency be under way and running at a speed of 14 to 15 knots half an hour after fires have been started in the coil boilers. To keep a ship with ordinary boilers in such readiness as this would be simply impossible unless she happened to be near a coal supply, for the fires would require to be kept so heavily banked that the supply in her bunkers would soon be exhausted.

Coil boilers are cheaper for the same power than either the Scotch or locomotive type. They can be taken to pieces and shipped in comparatively small pack-

vessels, merchantmen as well as men-of-war. The most serious objection to them is that they require clean fresh water for feed, but by the use of evaporators and filters this can be accomplished.

Description of the Ward Boiler.

The boiler used in the test is in size and proportions the nearest in the catalogue of the maker to that which he proposes for the purposes of the Navy Department. It has a plate iron central drum standing vertically in the center of the system and extending from beneath the grate to about 11 feet 6 inches above the base line. It receives all the feed water from an inside pipe that passes through its bottom and extends to near the water line. The space above the water line forms practically all the steam room. Surrounding this drum in nearly concentric circles are eight separate coils or sections, varying equally in dimensions from 36 inches, that of the inner one, to 110 inches, that of the outer one. Each section has 30 tubes or complete circles, in all 240. The tubes of each section are connected in half circles by

screwed joints to two vertical headers diametrically opposite to each other. The tubes are 2 inches in external diameter and are set at an angle of about 10° with the horizontal, to give direction to the current of circulation within them. The headers carrying the lowest ends of the half circles have a common connection at their bottom ends with a manifold, which at its inner end is connected with the central drum. Through this manifold they are supplied with water. Their upper ends are closed.

The headers carrying the highest ends of the half circles connect with a manifold at their tops, through which all steam generated passes into the upper end of the central drum. At their bottom ends they connect with a manifold which serves as a mud drum and as a blow off for purging the boiler. The headers proper do not extend below the level of the circular

them; but it is impossible to establish their exact value as water-heating surfaces. As it is probable that all the boilers tested by this board will be similar in this particular, comparisons may be justly made by the use of the total heating surface for the purpose of the above-mentioned table, at least when no superheating is apparent.

The greatest diameter of the outer casing is 10 feet 3 inches; the diameter of the outer casing around the drum above tubes, 4 feet 6 inches, and diameter of smoke pipe, 3 feet 4 inches. The height from base to top of drum casing is 11 feet 8 inches, and from base to top of casing around tubes 8 feet 2 inches. The light iron casing that envelops the furnace and tubes is lined at the furnace level with fire bricks, above that with curved tiles hollowed in the back. The weights are for the boiler tested as follows:

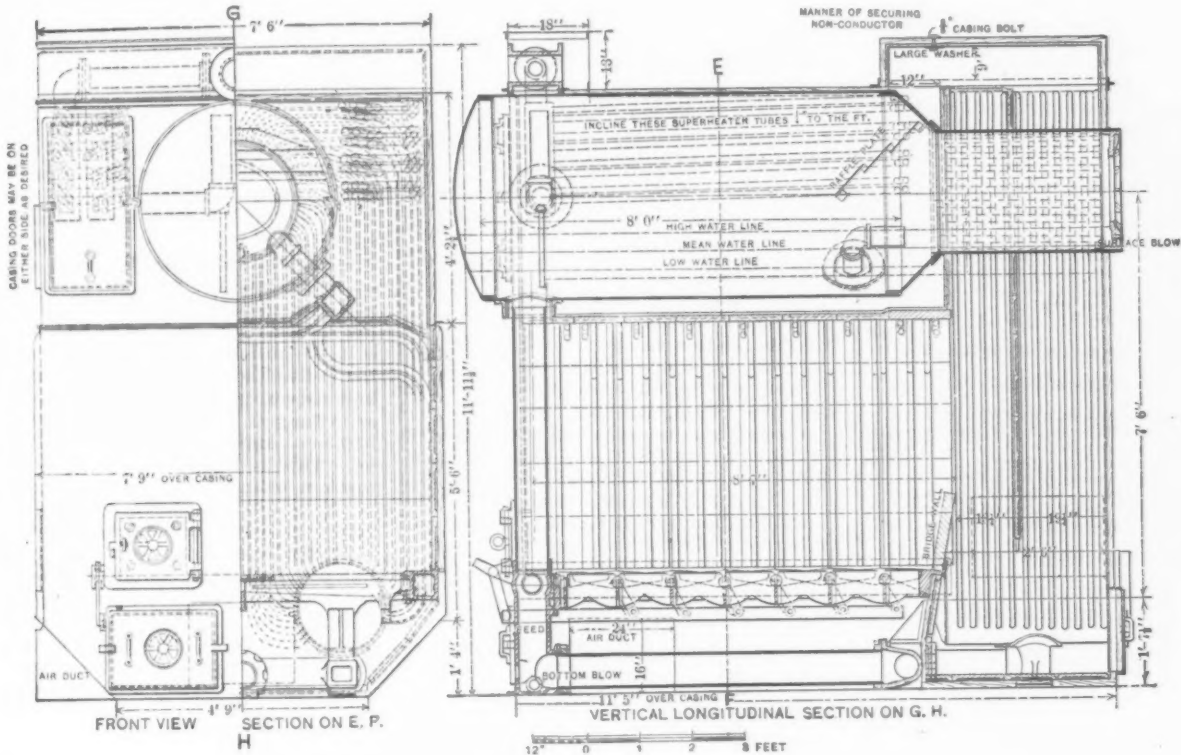
Result of Test of Ward Boiler.

TOTAL QUANTITIES.

Duration of test in hours, two of 12 hours each.....	42
Fuel (Nuttallburg, New River) consumed.....	70,022
Refuse from fuel, in dry ashes, dust and clinkers.....	3,389
Combustible consumed.....	66,633
Water fed to boiler, by tank measurement.....	461,884.6
Per cent. of the fuel in dry refuse....	4.8384

AVERAGE QUANTITIES.

Temperature of feed water, t_1	50.4
Temperature of steam, by thermometer.....	364.33
Temperature of uptake.....	882.833
Temperature of atmosphere.....	72.48
Temperature of fire room.....	75
Barometer, in inches of mercury.....	29.4205
Pressure of steam at boiler, in pounds per square inch above a perfect vacuum, 14.7 + pressure by gauge in pounds, P	174.4



The Cowles Water-Tube Boiler.

GOVERNMENT TESTS OF COIL BOILERS.

tubes, the connections with the lower manifolds being through iron pipes, 3½ inches in diameter, screwed into the bottom ends of the headers and joined to the manifolds by shallow stuffing boxes. These manifolds are beneath the grate, and they and the headers are of cast steel. The grate is an annulus and has an area of 66.5 square feet. This was reduced to 53 square feet for the test, by bricking, for convenience of manipulating the fires.

The total heating surface measured on the exterior of the tubes, headers and drum is 2490 square feet; measured on the interior it is 2074.5 square feet. A portion of this heating surface was, however, covered by the bricks laid on the grate, so that the area of the superficies was reduced to 2473.5 and 2060 square feet respectively. These are the figures used to represent the heating surface on Form 5 and in Table 2. About 30 per cent. of this heating surface is above the level of the mean water line. Undoubtedly there is always, when the boiler is under forced draft, a very large amount of water circulating through these upper tubes and receiving steam-producing heat from

	Tons.	Air pressure, in inches of water, in fire room.....
Empty boiler, exclusive of smoke pipe.....	11 1893-2240	2
Boiler with water to first gauge.	13 1354-2240	Revolutions of blowing engines per minute.....
Boiler with water to second gauge..	13 1906-2240	273.166
		Revolutions of blower per minute.....
		546.333

Rates of combustion.	Pounds of fuel.	Pounds of combustible.
Amount consumed per hour	2,917.5833	2,776.3750
Amount consumed per hour per square foot of grate surface (53)...	55.0487	52.3844
Amount consumed per hour per square foot of heating surface (exterior).....	1.1795	1.1224

Vaporization in pounds of water.	Per pound of fuel.	Per pound of combustible.
Apparent evaporation, by tank measurement, from a temperature t_1 and under a pressure P	6.5963	6.9318
Equivalent apparent evaporation from and at 212° and under atmospheric pressure.....	8.0345	8.4429
Actual evaporation, into steam of quality Q , from a temperature t_1 and under a pressure P	5.7729	6.0665
Equivalent actual evaporation from and at 212° and under atmospheric pressure	7.0314	7.3890
Potential evaporation, or evaporation had all the heat obtained from fuel been utilized in converting the water in boiler into dry saturated steam from a temperature t_1 and under a pressure P ...	5.9986	6.3037
Equivalent potential evaporation from and at 212° and under atmospheric pressure.....	7.3063	7.6770

Description of Cowles Boiler.

The boiler submitted for this purpose is so fully exhibited on the accompanying drawings that the general description of it seems superfluous. Its principal exterior dimensions are: Length (athwartships), 11 feet 5 inches; breadth, 7 feet 9 inches, and height, extreme, 12 feet 1 1/2 inches. Originally the heating surface was 2185 square feet, 30 per cent. of which lay above the mean water level. As, however, all the regular tubes (as the designer calls those between the drums) are beyond question filled with water circulating through them when the boiler is in use, we designate only as superheating surface that of the top of the shell and the superheaters proper. The combined area of these is 8 1/4 per cent. of the total original heating surface.

The grate area is 47 square feet. The ratio of grate to heating surface is 1 to 43.12. Kirkwood's rocking grates were fitted to the boiler, but after the closed fire-room was abandoned—i. e., during the tests of record—they were but little used as such.

The weight of the boiler (estimated) is. 9.75 Tons.
Actual weight of water to second gauge is. 1.8
Total. 11.55

Test of Cowles Boiler.

TOTAL QUANTITIES.

Duration of test in hours. 24.15
Fuel (George's Creek) consumed. 45,620
Refuse from fuel, in dry ashes, dust and clinkers. 6,327
Combustible consumed. 39,293
Water fed to boiler by tank measurement, W. 2,082.4
Per cent. of the fuel in dry refuse, &c. 13.87

AVERAGE QUANTITIES.

Temperature of feed water, *t*₁. 58°
Temperature of steam, by thermometer, 458.05°
Temperature of uptake. 985.90°
Temperature of atmosphere. 66.68°
Barometer, in inches of mercury. 30.10
Pressure of steam at boiler, in pounds per square inch above a perfect vacuum, 14.7 + pressure by gauge in pounds, P. 174.7
Revolutions of blowing engines per minute. 382

The Nation's Wealth.

The bulletin just issued by the Census Bureau on the assessed valuation of property is one of the most interesting which has been issued by the Bureau. It shows some striking contrasts between the wealth of different sections of the country. The figures of assessed valuation do not, of course, represent much more than half the real wealth of the country, and differences in the manner of making assessments may do injustice to the showing of particular States, but they are accurate enough to be instructive, and the errors probably correct each other when entire groups of States are considered.

The following table shows the assessed valuation of the property of the country for the past four decades and the estimated true valuation for 1860, 1870 and 1880:

Years.	Assessed valuation.	Estimated true valuation.
1860.	\$12,084,560,005	\$16,159,616,068
1870.	14,178,986,732	30,068,518,507
1880.	16,902,993,543	43,642,000,000
1890.	24,249,589,804	

From these returns it will be seen that the assessed value of all property has increased from \$16,902,993,543 in 1880 to \$24,249,589,804 in 1890, an increase during the decade of \$7,346,596,261, an amount equivalent to the true value of all property as returned by the United States Census of 1850 (\$7,135,780,228). Should it be found upon the completion of the inquiry in relation to the true value of all property in the United States that the same relation exists in 1890 between assessed valuation and true valuation as existed in 1880, the absolute wealth of the United States, according to the Eleventh Census, may be estimated at \$62,610,000,000, or nearly \$1000 per capita, as against \$514 per capita in 1860, \$780 per capita in 1870, and \$870 per capita in 1880. It is a striking fact that the Eastern States, with barely a third of the population of the country, possess more than half of the as-

manufacturing commonwealth of Rhode Island stands next with a per capita valuation of \$931.28. New York, in spite of the great wealth concentrated in the metropolis, shows an average valuation for the State of only \$629.45. All these figures are in striking contrast with the poverty of the States of the far South. South Carolina stands at the foot of the list with an average valuation of \$114.83, Mississippi comes next at \$122.15, Alabama next at \$130.26, and North Carolina next at \$131.46. The wealthiest of the States which took part in the Rebellion is Texas, with a per capita valuation of \$311.27, but such border States as Missouri and Maryland show valuations of \$293.50 and \$462.58. The poorest of the Western States are Nebraska, with an average valuation of \$174.49 and a loss of more than \$25 since 1880, and Illinois, with an average valuation of \$190.11 and a loss of more than \$65 since 1880. In Illinois, however, the State Board of Equalization declares that in 1880 the assessed value was 50 per cent. and in 1890 only 25 per cent. of the true value.

One of the most extraordinary boats on the great lakes is a passenger car transfer ferryboat operated in the Straits of Mackinac by the Duluth, South Shore and Atlantic Railroad. It has an enormous capacity for carrying cars, but its peculiarities are its strength, its shape and the number of its steam engines. It carries 24 steam engines for the performance of the various requirements of the business it is in. The hull of the boat is as solid as the walls of an old-time block house. The bow rises up and away from the water so as to hang or slant over it as if it were a hammer—and that is what it was built to be. This is because the boat is an ice breaker, intended to keep a channel open in the straits all winter, or to make one whenever she is pushed into the massive ice that forms in that cold region. The big boat advances toward the ice and, shoving her nose upon its edge, lifts herself upon it. Then a screw propeller under the overhanging bow performs its work of sucking the water from under the ice to enable the boat's weight to crush it down the more easily. Thus the destructive monster makes her way steadily through the worst ice of the semi-polar winters of that region, climbing up on the ice, crushing it down, scattering it on either side, and making no more of it than if it were so much slush.

As is well known, there are a number of rolling mills and steel plants in Pittsburgh which are operated as non-union mills, but pay prices for labor called for in the Amalgamated Association scale. Among the most prominent of these is the Solar Iron Works of William Clark's Sons Company, the Black Diamond Steel Works of Park, Bro. & Co., Limited, the large steel plant of Singer, Nimick & Co., the McKeesport Iron Works of W. Dewees Wood Company at McKeesport, Pa., and the Duquesne Steel Works of Carnegie Bros. & Co., Limited, at Duquesne, Pa. It is evident that the Amalgamated Association does not ever expect to regain hold in these mills, from the fact that at the recent convention of that organization, held in Pittsburgh during June, permission was given to members of the Amalgamated Association to go to work in these mills. This is a step that has heretofore been in direct violation of the rules of the Amalgamated Association, which formerly prohibited any member of that organization accepting any situation in any plant operated by non-union men. A number of men who are members of the Amalgamated Association are now at work in the different plants noted above.

Rates of combustion.

	Pounds of fuel.	Pounds of combustible.
Amount consumed per hour.	1,889.626	1,627.639
Amount consumed per hour per square foot of grate surface.	40.132	34.617
Amount consumed per hour per square foot of heating surface (exterior).98204	.80278

Vaporization in pounds of water.

	Per pound of fuel.	Per pound of combustible.
Apparent evaporation, by tank measurement, from a temperature <i>t</i> ₁ and under a pressure P.	6.156	7.147
Equivalent apparent evaporation from and at 212° and under atmospheric pressure.	7.450	8.650
Actual evaporation, into steam of quality Q, from a temperature <i>t</i> ₁ , and under a pressure P.	6.156	7.147
Equivalent actual evaporation from and at 212° and under atmospheric pressure.	7.450	8.650
Potential evaporation, or evaporation had all the heat obtained from fuel been utilized in converting the water in boiler into dry saturated steam from a temperature <i>t</i> ₁ and under pressure P.	6.49747	7.54344
Equivalent potential evaporation from and at 212° and under atmospheric pressure.	7.86325	9.12915

Illinois Steel Company.

The balance sheet of the Illinois Steel Company, July 1, 1891, was as follows:

Assets.

Cash in bank and on call. \$782,366
Accounts receivable. 2,924,262
Bills receivable. 629,503
Inventory. 7,098,282
Stocks, bonds and investments. 4,268,297
Plant and real estate. 15,833,041
Total. \$31,535,754

Liabilities.

Capital stock. \$18,650,635
Bonds. 6,200,000
Accounts payable. 2,238,568
Bills payable. 3,312,591
Surplus. 1,113,960
Total. \$31,535,754

essed valuation. New England, with less than a twelfth of the population, shows an assessed valuation of \$3,558,215,480, or more than one-seventh of the wealth, while New York, Pennsylvania and New Jersey, with about a fifth of the population of the country, possess but little less than a third of its wealth. These two groups of States, with Ohio added, have almost exactly one-third of the population, with an assessed valuation of \$12,392,830,094, or more than half that of the whole country.

Even more striking is the comparison of per capita valuation in different States. While the average for the entire country is \$387.62, Massachusetts stands easily at the head of all the States, with a valuation per capita of \$962.12. The little

The Manufacture of Galvanized Iron.

So many of our readers are consumers of galvanized iron, either in large or small quantities, that some account of the way in which iron is galvanized, together with a list of the concerns that are engaged in this industry, cannot fail to be of advantage. We propose at this time, therefore, to present a description of one of the works in some detail, with reproductions of photographs showing the processes, and also to give a list of the concerns that are engaged in the business, with brief memoranda of their brands. Our readers will find the list of considerable value, because it not only indicates the extent of the industry of manufacturing galvanized sheets in this country, but, in addition, shows where the works are located and

conveyed into the tank by means of a pipe from a steam boiler. The object of this acid bath is to clean from the black sheets any scale or dirt which may be adhering to their surface. The sheets are put in the tank on their edge and workmen continually separate them, one from the other, by means of tongs, so that the acid will reach every part of their surface. They are next taken from the acid tank to a tank containing water only. In this tank the acid is washed from the surface of the sheets, which are then taken on a table and scraped by workmen, who remove from the surface of the sheets with hand scrapers any dirt or scale that may be found still adhering to them. The sheets are taken from this table to a tank containing muriatic acid, for the purpose of still further cleaning them and also to prepare the surface of the sheets so that the zinc coating will adhere to the metal

by tongs from the bath. A workman next takes the coated sheets and wipes them off with a piece of canvas; he also removes any surplus metal which he finds adhering to the coating. The sheets are next loaded on a truck and taken to the rolls shown in the second illustration. These rolls are three in number, a large one on top and two smaller rolls below. The top roll is over 2 feet in diameter and is hollow. The two lower rolls, which are solid, are driven, and the upper one moves by friction. The sheets are run singly through these rolls for the purpose of straightening them, as the corners occasionally get bent up and the sheets are often otherwise in an unsatisfactory shape for shipment. This process completes the sheets and they are then ready for packing in bundles and shipping. Storage tanks are in use in galvanizing works for the purpose of holding black

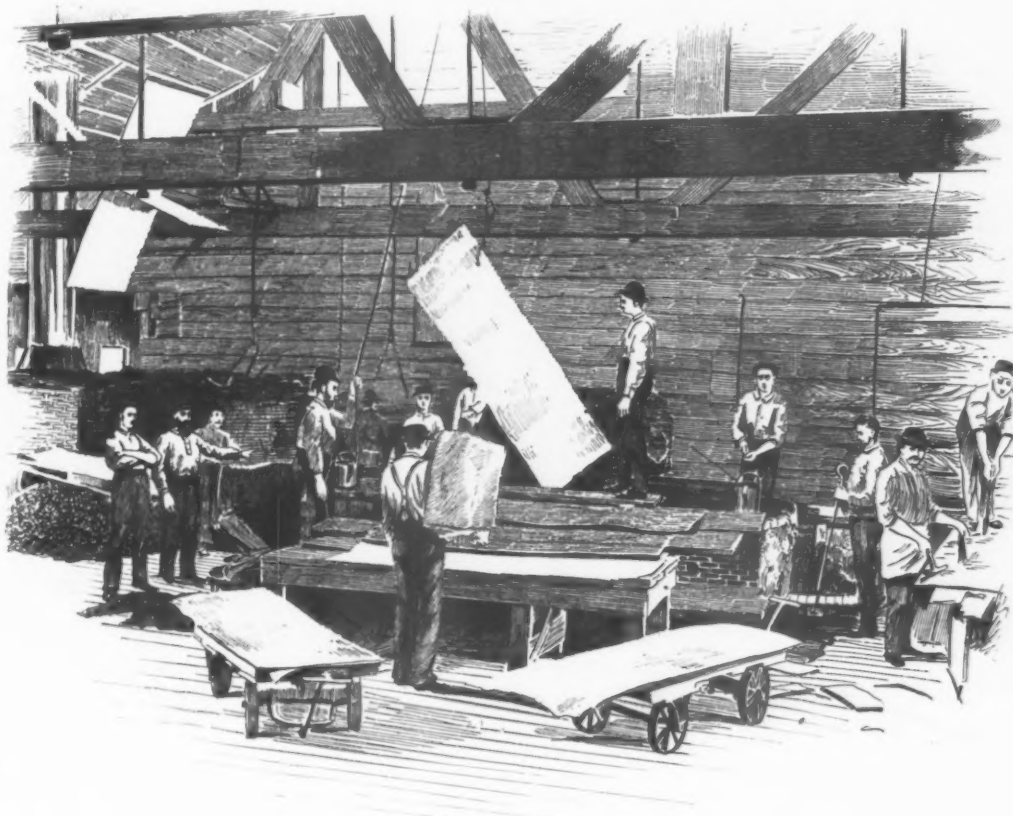


Fig. 1.—General View of Galvanizing Pot and Surroundings.

what are their distinguishing characteristics.

The illustrations presented are of the works of John McVoy & Co., at East Chicago, Ind. This firm have their main works and warehouse, together with one galvanizing pot, at 21-25 Michigan street, Chicago. The East Chicago works, however, have recently been equipped, and for the reason that they are new we have chosen them out of a large number for description. Two views are presented showing the interior of the galvanizing room. The first shows a galvanizing pot and its surroundings, and the second shows the rolls through which the galvanized sheets are passed to put them in condition for shipment. The third illustration, or diagram, shows the ground plan of that part of the works which is particularly devoted to the galvanizing pot and its auxiliaries. With the aid of these three illustrations a description of the process will be readily comprehended.

The sheets of iron or steel, as received from the rolling mills, are first immersed in a tank containing a mixture of oil of vitriol, or nitric acid, and water. The contents of the tank are heated by steam

more closely. This part of the operation is regarded by galvanizers as the most important step in the whole process. The iron or steel sheet must be thoroughly cleaned in order to secure a good job of galvanizing. The sheets when taken from the muriatic acid tank are loaded on an iron car, which is then pushed into a kiln, where they are thoroughly dried. When the sheets are taken out they are ready for the zinc bath. A tank (or pot, as it is technically called) is filled with melted spelter or zinc, which is kept liquid by coke fires constantly burning around it. For this reason the tank is imbedded in brick. The surface of the melted metal has a layer of coke breeze on the top, so as to cool off and clean the sheets as they are drawn from the zinc bath, as otherwise the surface of the sheets would have a yellowish tinge, which is not desirable. Small quantities of sal ammoniac are also thrown on the surface of the spelter from time to time to give the coated sheet a brighter appearance.

The sheets are put in singly on one side of the pot and immediately pulled out on the other side. The illustration shows a sheet just as it has been pulled up

sheets until the workmen are ready to galvanize them. These storage tanks are simply filled with water and the sheets when placed in them are thus prevented from rusting. It will be observed from this description of the process that there is no galvanic or electric operation whatever in connection with coating iron or steel sheets with zinc. The name, therefore, is misleading. However, it is in general use and no doubt will always continue so. Messrs. McVoy & Co.'s East Chicago works have two galvanizing pots, each capable of coating 850 sheets in one turn, or shift, depending, of course, on the thickness of the sheets which are treated.

In place of the rolls above described or in addition thereto there is used in many of the galvanizing works throughout the country the Britton leveling machine, a device which has heretofore been illustrated in these columns. All our readers are acquainted with what is known as "patent leveled iron," and which is supplied by a considerable number of the galvanizers whose names are mentioned below. The plan known as "patent leveling" anticipates stretching the iron slightly

by pulling the sheets by their ends instead of stretching all parts of the surface by rolling. The apparatus consists essentially of a hydraulic press with grips which take hold of the opposite ends of several sheets at a time. Just enough stretch is given to the metal to take out the buckle and cause it to lay flat. There is still another plan employed for leveling iron, and which is also used extensively in certain works. It is based upon a short curve or sharp bend to the iron as it passes between rolls of small diameter. It involves essentially the same principle as some of the wire straighteners in use.

The list of manufacturers of galvanized iron in the United States at the present time, as we have been able to compile it

CLEVELAND ROLLING MILL COMPANY, Cleveland, Ohio. Make black and galvanized sheets. Have their own steel works, with five open-hearth furnaces.

FALCON IRON AND NAIL COMPANY, Niles, Trumbull County, Ohio. Are just adding a galvanizing department to their black-sheet works, and expect soon to carry in stock a full assortment of sizes and gauges.

IRONDALE ROLLING MILL AND GALVANIZING WORKS, Wallace, Banfield & Co., Limited, Irondale, Jefferson County, Ohio. Branch office, 106 Third avenue, Pittsburgh. Make galvanized sheets branded "Irondale," "B. B." and "Juniata," also plain cold-rolled refined iron and soft sheet steel.

JOHN MERRY & Co., 535 to 547 West Fifteenth street, New York City, make galvanized sheets branded "Lion."

MARSHALL BROTHERS & Co., Front and Girard avenue, Philadelphia, make black, galvanized and lead-coated sheets. The brands under which their galvanized sheets are sold are as follows: "Penn Treaty" (best quality) and "Ironsides" (refined, or second quality).

MARSHALL LEFFERTS & Co., agents, New York City, office and warerooms 485-501 Cherry street. Down-town office, 54 Cliff street. Make galvanized sheets branded "Silver Tinned," "Best Bloom" and "Best Refined."

McDANIEL & HARVEY COMPANY, 1600

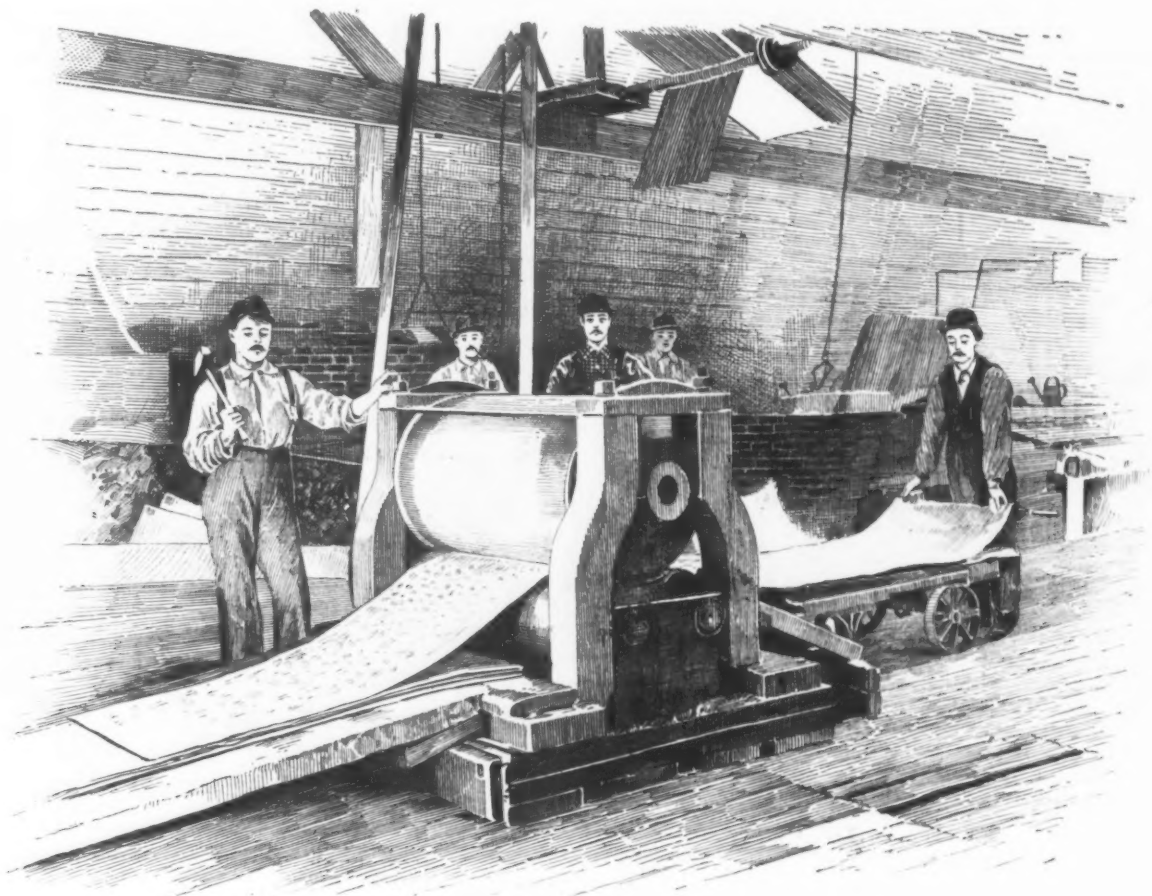


Fig. 2.—Galvanized Sheet Passing through Rolls.

from correspondence with the concerns named, is as follows:

ALAN WOOD COMPANY, Conshohocken, Montgomery County, Pa. Main office, 519 Arch street, Philadelphia. Make black and galvanized sheets branded "XXX" and "Stag."

APOLLO IRON AND STEEL COMPANY, Apollo, Armstrong County, Pa. Main office at Pittsburgh. Make black and galvanized sheets, branded "Apollo" Best Bloom. Have their own steel works, consisting of two open hearth furnaces. Use natural gas for fuel exclusively.

BANNANTINE GALVANIZED IRON MFG. COMPANY, 117 Souldard street, St. Louis. Make galvanized sheets.

BRITTON IRON AND STEEL COMPANY, Cleveland, Ohio. Make black and galvanized sheets, patent leveled and cleaned.

CINCINNATI CORRUGATING COMPANY, Piqua, Ohio. Make black and galvanized sheets. The latter are of two grades, "Juniata" and "Refined." The leading brand of the better grade is "Piqua," every sheet of which is guaranteed. Use natural gas for fuel.

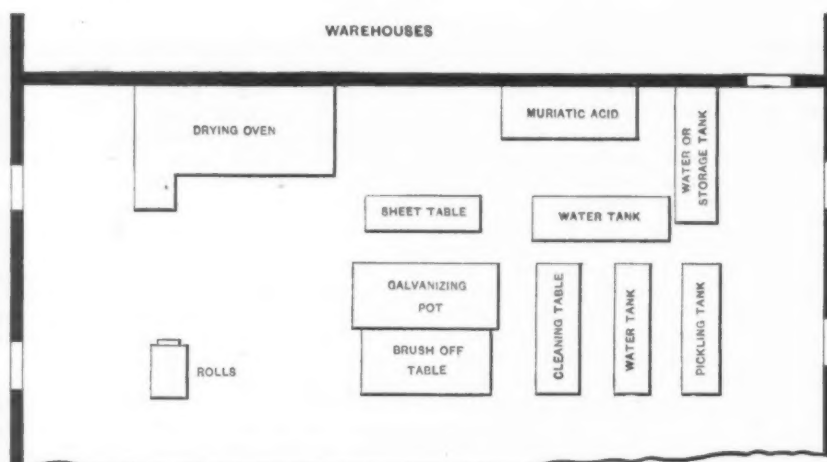


Fig. 3.—Plan of Galvanizing Department.

JOHN McVOY & Co., 25 Michigan street, Chicago. New galvanizing works at East Chicago, Ind. Brands are "Juniata" and "Best Bloom."

Washington avenue, Philadelphia. Make galvanized sheets, branded "Eagle" and "Chetwynd," also Harvey's patent cleaned black sheet iron.

REEVES IRON COMPANY, Canal Dover, Ohio. Are just completing new sheet-iron and galvanizing plant. Have four sheet mills, one cold rolling mill and a pickling and galvanizing works. The latter are 250 x 60 feet in size. Brands are "Juniata Dover" and "Refined Dover."

REPUBLIC IRON WORKS, Twenty-fifth street, south side, Pittsburgh. Make black and galvanized sheets, branded "Republic." Use natural gas exclusively.

SOMO MILLS, Moorhead-McCleane Company, Pittsburgh. Make black and galvanized sheets. Control their product from the iron ore through their own blast furnaces, mills and galvanizing works to the finished sheet. Use natural gas for fuel. Galvanized sheets are branded "C. H. B."

STANDARD IRON COMPANY, Bridgeport, Belmont County, Ohio. Make black and galvanized sheets. Their galvanized sheets are branded with full name of company—"The Standard Iron Company." Use natural gas in part.

ST. LOUIS STAMPING COMPANY, St. Louis, Mo., make three grades of galvanized sheets: "Juniata," "Charcoal" and "Refined." The brand and trade-mark is in the form of a diamond, with "Granite Mills" along the top lines and the quality designation within the inclosed space.

WHITAKER IRON COMPANY, Wheeling, W. Va. Make black and galvanized sheets of two qualities, "Juniata" and "Charcoal," under the brand "Crescent."

WM T. SIMPSON & Co., American Galvanizing Works, 298 East Pearl street, Cincinnati, Ohio. Manufacture and carry in stock gauges from No. 14 to No. 28, all of one grade and branded "Juniata."

Cost of Motive Power.

COMPARATIVE FIGURES FOR THE DIFFERENT SYSTEMS IN BIRMINGHAM.

In Birmingham, England, there are horse cars, omnibuses, electric cars, steam cars and cable cars, all operated under the direction of the Birmingham Central Tramway Company, limited, and the reports of this company, as commented upon by *Engineering*, afford a basis for interesting comparisons of the efficiency and economy of the different systems. The bulk of the traffic is handled by the steam lines, the cable roads coming next and the electric roads third.

The expenses, earnings and profits per mile run on the different systems are given as follows:

	Expenses, Cents.	Earnings, Cents.	Profits, Cents.
Steam.....	21.98	31.34	9.36
Horse.....	19.58	22.04	2.46
Cable.....	12.06	24.06	11.40
Electric.....	19.80	30.30	10.50

Along with these figures should be considered the fact that the horse cars constitute the original system, the steam lines have been in operation several years, the cable has been running only two or three years, while the electric lines were started only in July of this year.

An interesting work that is now in progress in Glasgow, Scotland, is the construction of three tunnels under the harbor from shore to shore for the accommodation of teams and foot passengers. These tunnels are 16 to 18 feet in diameter and are circular in section. They are side by side, and only 2 feet apart, and about 15 feet below the bottom of the river. The tunnels will be about 720 feet long, and will be reached at each end by elevators in pits about 80 feet deep. The work is to be finished next year.

The McGowan Back-Pressure Valve.

The back-pressure valve recently placed on the market by the John H. McGowan Company of Cincinnati, Ohio, is illustrated in the accompanying engravings. This valve, Fig. 1, is intended particularly for the utilization of exhaust steam from the engine, for the purpose of heating buildings, dry kilns, boiling tanks, water tanks, &c. Its construction will be understood from the accompanying vertical section, Fig. 2. There are no valve seats or other metallic parts to come in contact with each other when in operation, the bed of the valve being cylindrical, the

made in sizes ranging from 2½ to 18 inches, inclusive. They have been in successful use for some time.

Rapid Naval Construction.

Phenomenal progress has been made on the United States cruisers now on the stocks at Cramps' shipyards in Philadelphia. The armored cruiser New York, the contract for which was signed about a year ago, will be ready for launching inside of eight weeks, and the ways down which the steel monster will slide into the Delaware are already in position, and extend out into the river 50 feet beyond the

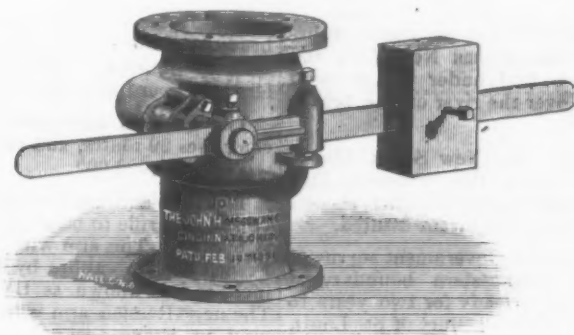


Fig. 1.—The McGowan Back-Pressure Valve.

lower end being bored out, and into this lower portion being fitted the closed-top piston, with graduated side openings. This piston is adapted to pass entirely through without seating, the upper part of the case being enlarged to give free vent to the steam when the valve is open. It will be noticed that the weighted lever is provided with an elastic cushion resting upon the bracket cast on the main body. This is for a support to prevent the piston passing too far into the cylinder. The operation of the valve is as follows: The engine is started and pressure accumulates under the piston sufficient to raise it, when it acts as a dash pot, and only raises

stern of the vessel. This is the quickest work that has ever been done by the great shipbuilding firm, and as the vessel need not be completed before January, 1893, there will be ample time to construct, place in position and test the engines and boilers. Lying alongside the New York is the long, slender Pirate, cruiser No. 12, and her protected deck is practically completed and the vessel is rapidly following the New York toward completion. This cruiser, Secretary Tracy says, will be one of the most important ships in the new navy. But what Mr. Nixon, the Naval Constructor, prides himself mostly on is the work on the great battleship No. 1.

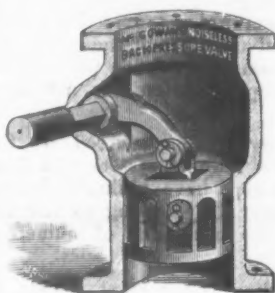


Fig. 2.—Vertical Section.



Fig. 3.—Horizontal Valve.

until the graduated openings allow a sufficient escape to prevent increase of pressure over that governed by the position of the weight attached to the lever. To hold the valve open the weight is placed on the opposite end of the lever. The openings in the piston being in excess of the area of the respective pipes for which the valves are intended, there is no obstruction to the free passage of the steam when passing through the valve when it is open. The lever on the horizontal valve, Fig. 3, is of equal length on both ends. It is so formed as to adapt the valve to be placed as shown, or reversed, when the lever will be on the top side, in which case the weight would have to be adjusted on the opposite end. These valves are

In a little over three weeks the keels of both battleships have been laid, and almost the entire frame work of the double bottom of No. 1 placed in position. These floating forts have a displacement of 10,298 tons.

Binghamton, N. Y., is making preparations to hold an industrial exposition the second week in October. Stock is being subscribed for and new buildings will be erected on a site yet to be chosen. The scheme seems to be meeting with great success.

There is every indication that German duties on grain imports will soon be suspended.

THE WEEK.

The wheat acreage of Minnesota this year is 3,359,983, a gain over last year of 275,000. Estimating the average yield at 17 bushels an acre, which is probably conservative enough, the yield for Minnesota would be 57,119,711. The acreage in North Dakota is 3,000,000 and at 17 bushels would mean a yield of 51,000,000 bushels, or 6,000,000 more than the estimate of last week. Leaving South Dakota at 36,000,000, the acreage of which is not known, yet the total yield will be 144,000,000 bushels. With wheat selling now at \$1.10 a bushel it is easy to estimate the tremendous profits of Western farmers this year.

It is ascertained that pneumatic tubes for postal service between New York and Brooklyn can be laid under the elevated railroads and over the river on the bridge at little expense.

New Zealand, like New South Wales, objects to entering the proposed Australian confederation, so that the success of the scheme is by no means assured.

The report of the Government survey to establish the northeastern boundary of Alaska will not be ready for two years to come. Dr. W. C. Kingsbury of St. Louis, who accompanied the expedition, believes that "Alaska is going to prove one of the richest mineral possessions of this country."

A mile in 39½ seconds, or at the rate of over 90 miles an hour, is the fastest run ever made by a railroad train. This unparalleled feat was accomplished August 27, on the Bound Brook Railroad, between Neshaminy Falls and Langhorne, by engine No. 206, drawing two ordinary coaches and President McLeod's private car "Reading," which is equal to two coaches in weight.

Vessel freights along the entire coast are so much depressed that all the ports are thronged with idle shipping. This is particularly true at Philadelphia and Boston, and is due to sluggishness in coastwise commerce. There is an excess of four-masted schooners. Freight from Philadelphia to Boston is reduced to 51 cents per ton.

Nearly all the wheat exports from the Pacific Coast since the opening of the new harvest year have been to France.

The new census report of Pennsylvania shows that the population of the State (now 5,258,014) increased a little less than 23 per cent. during the decade. That of Philadelphia, which is more than one fifth of the entire State, increased above the average, or 23½ per cent. Manufacturing towns in the western part of the State, where natural gas is available, show the largest rate of growth. The gain in Pittsburgh was at the rate of 52½ per cent., and Allegheny City gained nearly 34 per cent.

The abandonment of the port of Galveston by the Morgan Line New York steamers becomes a necessity on account of direct rail connection between Houston, Texas and New Orleans, and the absorption of the Morgan Line by the Southern Pacific Company. What Galveston loses by the change New Orleans will gain. The Mallory Line will now be the only direct route by sea between New York and Galveston.

The apprehended Western car famine begins to be felt. A Burlington, Iowa, dispatch says: "From present indications there will be a severe freight car famine all over the West before the crops are safely transported. Already the lines in Iowa are beginning to experience much

difficulty in getting cars as fast as needed. The immense crops are beginning to move, and every car available is pressed into service. Never has there been such a scarcity as now exists and the demand is growing daily. Local railroad officials are much worried over the situation, as it means not only loss of much needed traffic but loss to grain men.

The annual report of the Bureau of Statistics of Labor shows the amount of capital invested in Massachusetts industries up to 1890 to be \$391,200,269, an increase over 1889 of \$20,810,855. The investment in metals and metallic goods is \$25,193,000—increase, \$1,685,000; machines and machinery, \$22,625,000—increase, \$3,007,000.

The Russian Government has given a heavy subsidy to the Black Sea and Danube Shipping Company to erect a large dockyard at Reni.

The gridiron cable road in New York comprises 29 routes, and the capital represented is \$2,000,000.

The Russian Czar has officially decided on the new rifle to be adopted by the Russian army. The arm will differ from the French rifle in calibre by 0.01 part of an inch, and is known as the Mauser rifle. The new Russian arm is to be manufactured in France, where extensive small-arm establishments have, it is stated, already signed preliminary contracts. As soon as the work is well under way, it is calculated that at least 1600 rifles can be turned out in one day.

Queen Victoria has appointed a royal commission to supervise the representation of Great Britain at the Columbian Fair at Chicago. The Government grant to defray expenses is \$125,000.

The General Appraiser's docket at this port shows no protests from the iron and steel trade awaiting decision, and but one classified as manufactures of metal.

The Hamburg-American steamer Suevia lost three of the blades of her propeller in succession while coming over on her last trip, and will now have one of American manufacture.

The cork oak flourishes in California and in future years is likely to be the source of a large and lucrative industry. Thus, while nature has provided a region for the extensive culture of the grape, the material necessary to confine its distilled products for preservation has not been forgotten.

The extensive region covered by the Lehigh Valley railroad system will from this time forward have a single general outlet at Jersey City, owing to the absorption by the main line of numerous lateral branches.

The Canadian Government decide to permit the importation of American cattle to be slaughtered at certain designated points within the Dominion, where meat packing houses will be established.

Italy's national debt, exclusive of that of the provinces, is \$5,000,000,000.

The American Institute Fair opens 30th inst. The mechanical inventors are already taking space in Machinery Hall.

The window glass manufacturers of Indiana, in session at Indianapolis last week, formed an organization and adopted a resolution declaring "that no glass shall be made until wages, rules and usages are settled to the satisfaction of the Manufacturers' Wage Committee, and until the said Wage Committee shall have notified each manufacturer, through the secretary, of the date of starting."

Details of the famine in Russia now at hand fully verify the early advices re-

ceived by cable. Several large provinces are reduced to destitution, and throughout the empire the prohibition of the export of rye seriously deranges commerce and credit.

The population of Alaska, as shown by the new census, is 31,000, a decrease of 2000 in ten years. While the whites have increased, 8000 of the natives have died.

In addition to three steel battle ships of 4278 tons each and one torpedo vessel nearly finished in France for Japan, the Japanese Marine Ministry will soon submit to Parliament a plan for building 11 heavy ironclads, at a cost of \$45,000,000.

It is stated at Cleveland that the American Steel Barge Company, builders of the Macdougall "whalebacks," will double the capacity of their plant at West Superior, Wis. In that event about 50,000 tons will be launched by the middle of next summer, an output nearly one-half as large as that of all the lake shipyards in 1890.

One thousand men are now at work on the Baltimore Belt Line tunnel, to cost \$6,000,000, and which will permit trains from New York to enter directly into the city.

Charcoal furnace No. 2 of the Woodstock Iron Company, at Anniston, Ala., was burned on Saturday.

Plans have been nearly perfected for the construction of the proposed Philadelphia Bourse, in which to bring together all the wholesale departments of trade. A lofty fire proof structure is most in favor. The published design provides for 386 offices, yielding an annual revenue of \$283,000. The membership is expected to number at least 5000.

The Boston Transcript says that during the last eight months about \$3,000,000 have been paid in dividends by Boston copper mining companies.

As a skillful performance the feat of recovering the iron steamship El Dorado, wrecked on the Bahama Islands, bears some comparison to that of raising the Utopia, which sank off Gibraltar.

The republic of Honduras, as a field for enterprise, has great possibilities. A World's Fair Commissioner who has just visited that country returns highly elated by the prospects. He says: "I found in Louis Bogran, President of the Republic, one of the most admirable men. He is very intelligent and keenly alive to the importance of securing United States capital and immigration. He will promote the Chicago Exposition to the best of his ability, realizing what a golden opportunity it brings to advertise his own country." The great want of the country is railroad communication. Aside from this fact, the climate is such, at least in some sections, that foreigners often find themselves much nearer "paradise" than they had thought.

An architect who examined the Park place ruins finds that 70 tons of printing presses were placed on one floor, and had a pressure equal to 682 pounds per square foot, or more than two and one-half times that which all authorities recognize as the limit of safety in such a building. Vibration increased the hazards many fold.

Thomas A. Edison has devised a method by which the efficiency of magnetic driving belts may be increased and the wearing qualities be improved.

Mathey & Co. of Maiden lane, New York, have lately brought out a watch demagnetizer, the principle of which consists of revolving the watch within a magnetic field and gradually withdrawing it.

The Iron Age

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DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
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JOHN S. KING, - - - BUSINESS MANAGER.

The Railroad Outlook.

Contrary to all expectations, the railroad interests are still purchasing supplies very sparingly. So far as crops are concerned an almost ideal condition prevails, the American farmers having overflowing granaries, together with a heavy foreign demand. The most sanguine trader could hardly have pictured a more encouraging state of affairs for our people, and it seems as if prosperity should tread closely on the heels of the events of the past month, which were so portentous here and abroad. Last spring the general impression prevailed that as soon as even fair crops were assured the railroads would resume the purchase of needed rolling stock and other supplies, which would, of course, communicate activity to a vast field of almost stagnant industries. But the result shows how wide of the mark the best informed business men can guess. Not only were the good crops not anticipated by the railroads, but the actual movement of the crops does not force them into the market for any great quantity of equipment. Every Western paper speaks of the tremendous bulk of freight which will have to be hauled by the railroads from this time on through many months, and the absolute certainty of a worse car famine than was ever experienced. Even with the comparatively light crop movement in the last few years, car famines have been of periodical occurrence and sometimes have been very severe, causing congestion of trade in an entire section for some considerable time. The experience of the past is therefore relied upon as indicating what is to come in the immediate future. It is further pointed out that after three successive mild winters in the Northwest it is unlikely that the winter of 1891-92 will not see heavy snowfalls and serious interruption of traffic, which will cause a very active movement of freight whenever conditions are favorable.

The apparent apathy of railroad managers to the troublesome times ahead of them does not arise from indifference. It is well known that they would like to provide themselves with large additions to their rolling stock, as well as improve their terminal facilities, but they are not in possession of the cash to expend in this way. The railroads are too poor to do what they should, and it is extremely difficult, if not impossible, for them to borrow money by the issue of bonds or to raise funds by the sale of stock. The time seems to have come at last, which has long threatened, when railroad lithographs

are closely scrutinized by bankers and investors, and even the best managed roads find their credit none too high. For a considerable period it will be necessary for railroad companies in general to pay for their supplies from actual earnings and not from sales of securities. This bears hard on them this fall and winter, when they need extra facilities to enable them to increase their earning power, but it means good business in railroad supplies next year. It would not be surprising if more cars and locomotives should be purchased in 1892 than in any previous year. The earnings of this fall and winter by Western railroads will be far above the average, unless all advantages are thrown away by the reduction of rates to an unremunerative basis. This has been known to be done before in periods of heavy traffic and of course may occur again.

The heavy crops of this year may result in even greater benefit to manufacturers of railroad material than had been at first expected. Many communities on Western prairies are now wishing they had not been so active in fighting railroad corporations. Their crops are heavy, but a large part of their possible profit goes to pay for transportation by wagon to a distant railroad. The larger a farmer's crop the more onerous seems his tax for such transportation. Numerous settlements located since railroad extension was checked, mainly by hostile legislation, are now crying for relief and beg railroad companies to build more spurs and branches to accommodate them. It may be imagined with what irony the railroad officials answer appeals of this character. A reaction in favor of railroads will not be altogether an unexpected result in the granger States, where the surest passport to popular favor has for years been bitter hostility to railroad corporations. The elimination of this sentiment is most devoutly to be wished, as there is a vast area yet in the West which is much in need of better railroad facilities.

Canada's Census.

The inhabitants of the Dominion are sorely disappointed by the census returns for 1891, just completed. The sanguine predictions that were made as to the aggregate population have not proved true, as it is found that the actual population is less than 5,000,000; in fact, only 4,823,344. The increase during the last decade is 498,534, or 11.52 per cent., while in the United States for the same period the gain was 24 85. As stated by the Montreal Globe:

In the United States the gain by natural increase was 14.40 per cent., and the gain by immigration 10.45 per cent., so that our neighbors gained more by natural expansion alone than we have by natural expansion and immigration both put together.

The comparison is bad enough in itself, but when upon analysis it appears that during the decade, according to the Government returns, Canada received 850,000 settlers through immigration from Europe, the inference is unavoidable that a whole-sale emigration to more inviting fields in

the United States had taken place, thus accounting for the deficiency. The following is an abstract of the returns:

Population of Canada.		
	1891.	Increase in decade.
Maritime provinces:		
Nova Scotia.....	450,523	9,951
New Brunswick.....	321,294	61
Prince Edward Island.	109,088	1,970
Totals.....	880,905	10,200
St. Lawrence:		
Quebec.....	1,488,586	159,559
Ontario.....	2,112,980	186,067
Totals.....	3,601,575	315,636
Western provinces:		
Manitoba.....	154,442	92,182
Assinaboia.....		
Alberta.....	61,487	35,972
Saskatchewan.....		
British Columbia.....	92,767	43,308
Unorganized.....	32,168	1,237
Totals.....	340,864	172,699
Total population....	4,823,344	498,534

The Maritime provinces have stood still. Ontario and Quebec have added to their population at the rate of 9 1/2 per cent. The Northwest has done fairly well. In Manitoba alone is there found a good measure of satisfaction. The growth in Montreal and Toronto will account for the largest share of the increase in Ontario and Quebec. In some of the rural communities there must have been a decline. The city of Vancouver has grown from nothing in 1881 to 13,685. St. John, St. Catharines, Charlottetown, Three Rivers and Port Hope declined.

The Canadas during the last decade have passed through a crucial period. Under the favoring auspices of the Imperial Government the Provinces have done their utmost to develop a strong national sentiment, conjoined with loyalty to the crown, in order to realize most speedily the designs of the Confederation. To this end there has been a lavish expenditure on public works, the last grand master-stroke being the construction of a trans-continental highway to become the American section of a new and more expeditious route from Europe to Asia and the Indian Empire. Incidentally the provinces from the extreme East to the West, from Halifax to Vancouver, were expected to be united more closely in maintaining the public credit and advancing the general welfare. At the same time the vast unexplored regions of the Northwest opened up prospects of unlimited territorial extension, and confidence was felt that under a well-organized system of assisted immigration—no effort being spared to disseminate information respecting the boundless resources and unsurpassed fertility of Manitoba and regions beyond—a new Western empire would spring into existence. Such glowing prospects seemed to warrant an expansion of the public debt to proportion

commensurate with the general scheme. Canadians felt that at least in their facilities for transportation they could not be outdone by their neighbors in "the States."

The fact is now too evident for concealment that there has been a miscalculation somewhere. The millions of pounds sterling invested by shrewd capitalists and practical business men have not yielded satisfactory returns, taken as a whole, and as years pass by new problems of finance arise which involve many perplexities. Perhaps that which now confronts the Dominion is the most intricate and decisive of all, the Maritime Provinces finding themselves directly opposed in their commercial policy to that which is favored by the Ottawa Government. And as appeared at the last election in Canada, when the present ministry retained their power only by a meager majority, the entire country is politically dissevered on the vital question of commercial intercourse with the United States—a question greatly intensified in significance by the operation of the new tariff adopted at Washington, and respecting which the international conference arranged for October next offers little of an encouraging nature. Among other adverse influences felt in the Dominion and which aggravate the general situation is a succession of bad harvests, discouraging immigration and creating confusion and derangement in all fiscal calculations, whether relating to the Government Treasury or to trade and finance in the several communities. The magnificent crops this year lately promised 20,000,000 bushels for export, but from dispatches just at hand it appears that the frost of last week "destroyed about one-seventh of the entire wheat crop of the Red River Valley from Fargo to the British Possessions." Taking all things together prospects in Canada are not what might be desired, and the existing political dissensions do not help to alleviate the situation. The moment is opportune for the real statesmen of the Dominion to come to the front.

The Pacification of Chili.

Internecine strife in Chili was abruptly terminated by a battle between President Balmaceda's forces and the Congressional troops under General Canto, fought on the hills back of Valparaiso on Friday, August 28. The defeat of the former was entire and decisive. At once a strong contingent from the successful army was sent to Santiago, five hours distant by railroad, and the capital surrendered without opposition, confirming the triumph. Balmaceda fled, taking the route across the Andes, and will probably soon be heard from on the Atlantic Coast, at Buenos Ayres or Montevideo. The total casualties are variously estimated at from 900 to 2000, of whom much the larger proportion was on the Government side. A few days more and the Junta, whose headquarters were at Iquique, will have assembled at Santiago and formed a provisional Government, so that the rehabilitation of the country can proceed. The American Admiral Brown, whose vessels were at Valparaiso, seems

to have successfully avoided all complications, unless some questions shall arise from his refusal to surrender prominent political refugees who had sought refuge under the American flag.

General Basquedano has been recognized as President *ad interim* of the Republic by the members of the Junta, and little doubt is felt that this action will be ratified at Valparaiso. Merchants in New York who are identified with Chilean trade with few exceptions express themselves gratified with the result, and this apart from any pecuniary interests involved. As a triumph of principle the success of the Congressionalists is regarded with favor. One of the best informed, who also is one of our principal exporters, Congressman-elect Coombs, of the firm of Coombs, Crosby & Eddy, said that he regarded the fate of Balmaceda as a precedent which may affect in one important sense all the South American republics, serving to establish them more firmly on a sound constitutional basis. Not only in Chili, but in Venezuela, Mexico and elsewhere, the ex-Presidents have been prone to claim for themselves the prerogative of shaping future administrations, dictating measures which come within the jurisdiction of Congress alone. This defect in government has been signally rebuked. Mr. Coombs looks for a gradual resumption of trade, although on account of exhaustion caused by war and the increased indebtedness of the country, assuming that the Government will recognize Balmaceda's issues of paper money, the process of resuscitation must be slow.

The newspaper opponents of the domestic manufacturers of tin plate appear to have exhausted themselves. There has latterly been a notable decrease in the number of adverse articles appearing in the daily press, and in some instances the most furious writers against American tin plates have actually permitted whole weeks to pass without a murmur on the subject. It was, perhaps, rather disheartening to keep up a constant fusillade of bitter arguments and unpleasant epithets while manufacturers were steadily going ahead with their preparations to engage in the new industry as though they were backed by the unanimous sentiment of the country. The violence of the attacks made on these enterprising Americans was too great to be kept up, unless signs of weakening had become perceptible among those who proposed to engage in the business. But their number seems to be augmenting instead of diminishing, just as though the opposition was a stimulus instead of a blight. American roofing plates have a standing in the market now, and American bright plates will soon be so plentiful that they will no longer be regarded with curious eyes. It is suggestive of a favorable change in public sentiment on this question that latterly rumors have become more abundant with regard to the establishment of new tin-plate works and the transplanting of Welsh tin-plate enterprises to American soil.

PERSONAL.

Henry D. Hibbard of Pittsburgh has accepted the superintendency of the Taylor Iron and Steel Company of High Bridge, N. J. He sails from Boston to Liverpool on September 5 for a two-months' business tour.

Charles H. Cramp and Frank Cramp of the shipbuilding firm of Cramp & Sons have returned from Europe, where they visited the yards at Portsmouth and Chatham, the works of Laird Bros. & Co., at Birkenhead, and of John Brown & Co. and Cammell & Co., manufacturers of armor plates.

Clinton M. Ball of Troy, the well-known inventor of the Monarch magnetic separating machine, was the victim of a painful accident last week. While riding on the Hudson River Railroad a stone crashed through the car window, bruising his face and injuring his eye. The fears at first entertained that he would lose it have been dispelled by later more favorable reports.

R. J. Gross of Dunkirk, N. Y., connected with the Brooks Locomotive Works, has been commissioned by Willard A. Smith, director general of the World's Columbian Exposition at Chicago in 1893, to represent the locomotive department of the exposition in Europe and induce foreign makers to exhibit. Mr. Gross will sail on the City of Rome September 5, to be absent several weeks.

In one of the Pittsburgh papers of this week there appeared a statement to the effect that H. C. Frick, chairman of the H. C. Frick Coke Company of Pittsburgh, contemplated resigning his position. The item further stated that Thos. Lynch, at present general superintendent of the H. C. Frick Coke Company, would succeed to the position made vacant by the retirement of Mr. Frick. We are advised that there is no truth whatever in the above report, as no such step is contemplated by Mr. Frick for the present at least. As is well known, Mr. Frick, in addition to holding the chairmanship of the H. C. Frick Coke Company, is also chairman of Carnegie Bros. & Co., Limited, and divides his time between the two concerns.

W. J. Taylor, general manager of the Taylor Iron and Steel Company, High Bridge, N. J., sails for England on the 8th inst.

David Thomas, superintendent of the Thomas Iron Company, Hokendauqua, Pa., has returned from a brief European trip.

Big Steel Propellers.—The Providence and Stonington Steamboat Company, as was recently mentioned, have placed an important order with the Harlan & Hollingsworth Company of Wilmington, Del., for two steel steamboats. The dimensions of each boat will be as follows: Length on water line, 302 feet; length over all, 310 feet; beam deck, 45 feet; over all, 60 feet; depth of hold, 17½ feet. All the plates in the hull will be of steel, and four Scotch boilers will be used of 60,000 pounds, to stand a pressure of 160 pounds. Each boiler will contain three corrugated furnaces of 46 inches outside diameter. These vessels will mark a new departure in the style of boats for the Sound lines, as they are to be propellers instead of side-wheel boats. Both boats will be fitted with all modern improvements, such as electric lights, fire apparatus, circulating pumps, &c. The vessels are designed to run at a speed of 17 statute miles an hour, with 600 tons of freight and 400 passengers with ordinary baggage. The power will be furnished by triple-expansion engines. The vessels will be completed in May.

WORLD'S FAIR NOTES.

Progress on the Grounds.

Work on the Exposition Buildings at Jackson Park, Chicago, is progressing in a manner satisfactory to the Board of Directors. Every section of the big site presents the appearance of a vast freight yard full of railway cars piled high with lumber. Large as the grounds are they are filling up. The outlines of all the buildings are mapped out by the foundation works and the tons of material piled around them.

A large consignment of lumber has arrived for the Fisheries Building, and this week will witness a start on that structure.

The work on the Woman's Building has advanced so far that the framework has been reared. The building is, therefore, ready for the exterior decoration and interior work.

The site of the Horticultural Building is covered with material. The contractors are not quite ready for actual foundation laying, but expect to go forward with the work at the beginning of next week.

On the Transportation Building the contractors have begun laying foundations. They have, indeed, nearly completed this work, and 50 men are pushing it forward.

On the Mines and Mining Building the flooring has been laid, and several hundred workmen will soon begin rearing the superstructure.

Little has been done on the Electricity Building since Chief of Construction Burham ordered a stoppage until he might revise certain features of the plan.

In the Administration Building the piling for the foundation is being driven.

The site for the naval exhibit or battle ship is almost complete. The piling has been sunk and workmen are engaged on the finishing wood work. Piles for the breakwater to protect it have also been driven.

A great deal has been completed in the modeling department and the workshops for exterior ornamentation. All the models for the decoration of the Electricity Building are now finished, and a model for the ornamentation of the Women's Building will be completed within a few days. Nearly two-thirds of the models for the Agricultural Building are ready.

In the landscape department the last week has been devoted to seeding and planting and the adornment of the edges of the lagoons. Thousands of aquatic plants have been set out upon the edges of the wooded island, and landscape gardeners are daily engaged in extending the work.

Changes in Building Plans.

During the last week changes were determined upon in two World's Fair buildings which will, in one sense, make them mammoth structures. The Manufacturers' Building will, according to the new plan, be completely roofed over, and with the galleries, afford a space approximately of 40 acres. The changes made in the building knock out the large interior courts which the architects had designed and roofed them over. There will be a single span by this arrangement running through the center 1400 feet long and 385 feet wide. There will be in the galleries projecting balconies which will permit the visitors to look down upon the vast crowds of visitors below. The estimated cost of the changes to be made is \$100,000.

According to the original design a shoe and leather building costing \$100,000 was to have been constructed in one of the courts, and a music hall costing a like amount in the other. It now seems that the leather display intended for the special building will be installed in the main

structure. The Music Hall will be constructed elsewhere and contain the exhibit originally intended for it.

Besides changing the plan for the Manufacturers' Building it has been decided that the Machinery Annex should adjoin Machinery Hall on the west end. The annex is to be 550 feet long and 500 feet wide. It will be a prolongation one-story high of Machinery Hall, so that the entire building will be 1400 feet long, almost equaling in length the Manufacturers' Building.

Freight Rates on Exhibits.

Exposition officials were disappointed when they learned that the managers of the railroads in the Western Freight Association had decided unanimously not to grant half rates each way for exhibits to the exposition, but to charge full rates coming, as originally proposed by the railroads. They were disappointed for two reasons, 1, because they had sent out a special request for half rates, and, 2, because the Transportation Committee of the Exposition, which is composed of railroad officials, had assented to the action of the Western Freight Association.

Here is the interesting and disappointing fact which stared the exposition management in the face: It found members of the Board of Directors on the Transportation Committee asking, in their capacity as exposition directors, half rates to the fair, but in their capacity of railroad officials voting against their own proposition.

Traffic Manager Jaycox said he was sorry to learn that the railroads in the Western Freight Association had voted against the half rate. He offered no criticism, but said there were a number of classes of perishable exhibits which would be sent to the exposition and could not be returned. On these he could not see that the railroads were doing anything for the fair.

The Tower Project.

People with schemes for the World's Fair but no money to back them are wasting their time in forwarding their projects to the exposition management. The Committee on Ways and Means sat down on a host of enthusiasts when it passed the following resolution:

Resolved, That no application for concessions or privileges be entertained unless accompanied by a guarantee from responsible parties that applicants can and will carry out what they propose in such applications.

By this resolution M. Eiffel was knocked out in reference to the tower proposition which was received from him Monday. M. Eiffel, although ready to build a tower, will not do so except at the expense of the exposition or some other company. It did not take the committee long to discover that M. Eiffel proposed merely to act in the capacity of an engineer and contractor. He guaranteed no funds, and when the committee learned this it passed the foregoing resolution, dropping M. Eiffel's scheme. If he wishes to build a tower and pay for it himself, as other bidders have been asked to do, he will receive further consideration.

After dropping the Eiffel proposition the committee listened to a verbal one to build a tower by Chicagoans. The backers of this proposition are William E. Hale of the Hale Elevator Company and E. F. Cragin. Mr. Hale stated definitely that his company would be willing to build a tower 1200 feet high. He estimated the cost at \$2,000,000, and asked the committee to be liberal in the way of making a charge for the privilege. Definite action was not taken, but a member of the committee said it was most favorably disposed toward the proposition of Mr. Hale.

The Exposition Pumping Plant.

The Grounds and Buildings Committee agreed to accept the offer of Henry R. Worthington to furnish pumps free for the exposition. The pumps are to have a capacity of 40,000,000 gallons a day, and will be ample for all the fire protection and steam power that will be needed. In addition to the regular fire apparatus the committee recommends that a fire tug able to throw from two to four streams of water be furnished for the exposition grounds to operate in the lagoons in case of fire in any of the buildings. It is thought that such provision must be made for fighting fire, for the ground is so heavy that fire engines could be handled very slowly.

Special Features of Some Exhibits.

The wonderful advancement in marine engineering within the past 25 years is forcibly illustrated by a set of drawings the United States Bureau of Steam Engineering is now engaged upon as a part of the naval exhibit for the World's Fair. There will be a number of pictures showing the machinery plant of the swift cruisers Nos. 12 and 13, which are capable of a collective horse-power of over 20,000, the battle ships and several other modern ships, but there are two prepared especially for demonstrating the vast stride in marine engine building. One of these illustrates the cumbersome plant of the old paddle-wheel Powhatan. This machinery, designed for 1200 horse-power, took up a space 60 feet long and 42 feet high. The other shows the engines and machinery of the torpedo cruiser No. 3 recently designed, which are capable of the same horse-power, and yet the whole plant is confined in a space 13 feet long and 7 feet high—very much less than the space required for the machinery of the Powhatan. In her palmiest days the latter would not make over 9 knots, while the torpedo cruiser, if she realizes expectations, will make 25 knots. In addition to the designs of the machinery the Bureau of Steam Engineering will probably be represented at the fair by a complete set of engines and machinery of one of the new men-of-war, erected and operated the same as when placed in a ship.

There will be an interesting exhibit at the exposition of cotton gins, and of the process of ginning, delinting and baling cotton. Chief Buchanan is now in communication with the cotton machinery manufacturers of the country, and has promise of exhibits from two heavy houses in the South. One gentleman says that his company own the first cotton gin ever made by Mr. Whitney, and that he has in his possession the original patent granted to Whitney, with the official signature of George Washington as President of the United States. A dealer in Birmingham, Ala., applies for space in which to make an exhibit of cotton machinery. He proposes to show the progress of cotton handling from the old Whitney gin up to the improved methods of the present.

E. T. Halsey of Louisville, Ky., writes to Vice-Chairman McKenzie that he has seen Mr. Kelly of Louisville, son of William Kelly, who invented that is known to-day as the Bessemer process of making steel. Mr. Kelly, the son, is president of a large manufacturing concern in Louisville. He says that the original plant for making steel has for years been held by the Cambria Iron Company of Pennsylvania, and can be obtained for exhibition at the World's Fair. Mr. Kelly promises to do everything possible to obtain this. Mr. Kelly, in a letter to Chief Skiff, says that if it is found to be impossible to restore the original converter first used in the process, he has in his possession all the original drawings, and from them fac-similes of the original furnace can be built.

Miscellaneous Items.

A contract has been made with the Babcock & Wilcox Company to furnish two Babcock & Wilcox water tubular boilers and to furnish the material and build the foundation for one engine and three fire pumps for temporary power, lighting and fire service at the park for \$2600.

The Classification Committee has declined to take engineering out of the Department of Liberal Arts and place it in the Department of Transportation. It also decided that electric motors, when exhibited alone, should be installed in the Department of Electricity, but if the motor were united with any means of conveyance, such as a street car, then it was determined that the exhibit should go in the Department of Transportation.

Thomas J. Hurley, president of the Texas World's Fair Exhibit Association, visited headquarters last week for the purpose of securing on the exposition grounds a trial plant of the Unicycle Electrical Elevated Railway. This is a single-track system which, Mr. Hurley thinks could be adopted with advantage by the exposition management. He says the trains may be run at a speed of 100 miles an hour, and can be made to turn on a sharp curve. He says the company are ready to spend \$250,000 on the road at the exposition if the concessions for constructing it can be secured.

The managers of the great naval exhibition at Chelsea, England, have consented to allow the model of Nelson's ship, the Victory, to be transferred to the Columbian Exposition.

More than \$5,000,000 of exposition work is now contracted for and is in progress.

Colonel Fred. Brackett, chief clerk of the Treasury Department, has been appointed special agent of the Department, under section 12 of the World's Fair act, relating to the admission of foreign goods intended for exhibition at the fair. He will establish in London a bureau of information for the benefit of intending exhibitors, where he will supply to all applicants information relative to the methods of shipment and entry of goods intended for exhibition at Chicago, routes and cost of transportation, methods of caring for goods unaccompanied by agents, regulations for returning the same to exhibitors, &c.

Everybody is to be given a chance to bid on furnishing intramural transportation to the fair. It has been decided by the Construction Department to make a statement of just what is desired in the way of speed and accommodation for visitors. Then all will be allowed to bid. The road must be elevated, and the sentiment seems to be in favor of an electric line.

Treasurer Seeberger recently received a check for \$20,000 from the McCormick Harvester Machine Company, in full payment of their 2000 shares. "At this rate," said the pleased official, "it will not be long before we can call upon the city of Chicago for its \$5,000,000 in bonds." Incidentally, 2000 admission tickets were sent to Mr. McCormick.

Last Saturday Frederick Prentice of Ashland, Wis., announced that he was ready to donate to the World's Fair an obelisk of solid brown stone larger than any of those found in Egypt. He offered to give it to the State of Wisconsin if the officials would have it put up in Jackson Park as a part of the exhibit. The proposed obelisk would weigh nearly 400 tons, and would, it is estimated, be the largest mass of brown stone ever quarried at one time. The proposition is likely to

be accepted by the State Commissioners of Wisconsin, and it will take over a year to get the stone out in the shape proposed.

Foreign Shipyards.

Irving M. Scott, general manager of the Union Iron Works of San Francisco, on his recent return from Europe, told the story of his wanderings to a reporter of the New York Times:

I arrived in London in the latter part of July and immediately made for Siemens, the electrical manufactory. Here I saw the electrical fittings for 40 British war ships under way, all having relation to communications between the captain on the bridge and the engine room, and designed to indicate in various ways every movement and direction of both engines and rudder. Leaving Siemens in the evening I took the night train for Paris, saw some of my family at the Grand Hotel, and rushed off in the course of a few hours for Hamburg.

Such docks as those at Hamburg I never saw anywhere else in the world. Why, those Germans actually docked and undocked a 5000-ton ship in 32 minutes! They did it for my edification, and I had to acknowledge that they were ahead of the Union Iron Works. And, what is more, they moved a 5000-ton ship into position for docking in 5 minutes and 15 seconds. At Hamburg I saw the whole of the German merchant ship plant, and I think it safe to say that in building merchant steamers the Germans are a good second to the English.

From Hamburg I ran inland to Essen, visited Krupp, and saw the ease with which his establishment handled and fabricated 50 and 60 ton forgings. I was given every opportunity to observe while at Krupp's. Nothing apparently was kept back. It would be a big undertaking to attempt to narrate the wonders of Krupp's, though one thing is certain, and that is our own plant at Bethlehem, though not equaling Krupp's in size, has equal facilities for gun work. We have a 125 ton steam hammer, while Krupp's largest hammer is a 95-ton affair.

From Krupp's I ran over to Clermont, in the south of France, and took a look at the cellulose plant at that place. For my inspection a 6-inch shot was fired through a section of cellulose armor, such as would be placed in the side of a war ship. The aperture, which was exposed to the water, closed almost immediately. The cellulose would absorb 15 times its weight of water. Right here it should be said that there is considerable misunderstanding on this side regarding the properties of cellulose and woodite. The former is a water excluding substance. The latter claims only properties of buoyancy.

From Clermont I again crossed into Germany, going to Nuremberg. Here I saw the German system of electric search lights, which in point of efficiency are second only to the French. From Nuremberg I crossed again into France and visited the electric search light plant of Sautter, Lemonnier & Co. The French search lights are undoubtedly the best in the world. I early came to the conclusion in looking into this subject that the efficiency of a search light depends in its lenses, and in making lenses the French are ahead of the world. On all British war ships where only one or two search lights are carried the design is Sautter's; where three lights are carried one is of English design, and where four lights are carried three are Sautter's and the fourth is English.

From France I rushed off to London and thence to the naval exhibit. Fully 16,000 people daily attend this exhibit, which, I understand, will keep open for several months yet. This same exhibit is

firing the enthusiasm of the English people. I doubt if much trouble is encountered when appropriations are again called for in Parliament. Every day a sham fight is given, miniature vessels maneuvered, torpedo boats exercised and guns and torpedoes fired, until all the features of modern naval warfare are exhibited to the people in a thoroughly realistic fashion.

Giving one day to the exhibit, I was on the day following at the British gun arsenal at Woolwich, then again back at Siemens, where I saw experiments carried on with woodite. Leaving London, I went to Portsmouth, the great naval station of England; was taken on board by Messrs. Stama, Miller and Elger, all of the British Admiralty Board, and shown the yards, docks and ships under construction until I could not possibly wish to see more. I was aboard the new monster, the Royal Sovereign, and also on the Conqueror, both nearly finished. On every side I was asked: "Is there anything we can show you that you have not seen?" While at Portsmouth the British torpedo flotilla, fresh from the maneuvers, came in. The torpedo-boat catchers struck me as being seaworthy vessels, despite the adverse criticism they have received.

From Portsmouth I went to Sheffield and took a look at the British compound armor plates. Notwithstanding the result of the nickel steel tests in this country the British still hold to compound armor. They say that they know what compound armor is, that they can answer for it, and as for nickel steel they are unable to handle it in thicknesses exceeding 4 inches without its cracking. I saw 50 and 60 ton armor plates being handled at Sheffield as if they were mere toys.

I went to George Elder's, now known as the Fairfield Shipbuilding Company, after leaving Sheffield. This establishment is at present building for the Cunarders a five-day ship for the New York and Liverpool passenger trade. I have no doubt that the ship will do it. From Elder's I went to the Lairds, at Birkenhead, and then down first the Clyde, and second the Thames. On all sides it was one vast system of shipbuilding and iron and steel plants. Everywhere I was struck with the magnificent facilities of the English establishments for handling heavy plates. In shipbuilding England is certainly ahead of the world, though the best war ship work, I candidly believe, has been turned out by France. Germany has done some remarkable work with torpedo boats, and, as I said before, is a good second best in merchant steamship construction.

What I saw of war ship construction and gun work abroad was a mere fraction of what is going on. Americans cannot possibly realize the immensity of this work on the Continent.

I also went to Belfast, and I can assure you that Belfast has one of the best-equipped plants in Europe. The workmen are mostly North of Ireland Protestants. The capital, I believe, is English and Scotch. The greatest rivalry just now exists in England to build a ship that will beat both the Teutonic and Majestic. Both of these vessels were built at Belfast.

An error crept into our reference to the Baker Iron Company last week. We stated that the Baker Iron Company had acquired the patents and good will of the Baker Chain and Wagon Iron Mfg. Company, of Allegheny, Pa. It was not the latter company who carried through the negotiations with the new company, but it was J. H. Baker himself. Mr. Baker resigned the management of the Baker Chain and Wagon Iron Mfg. Company some time since, and he is only connected with it as a stockholder and director.

San Francisco News.

(By Telegraph.)

After listening to the report of a committee appointed for the purpose, the Board of Manufacturers and Employers of San Francisco, on Tuesday last, adopted a declaration of principles and elected a board of directors. By the time this reaches you the constitution and by-laws will have been adopted and officers elected. The gentleman named for the presidency, I. J. B. Stetson, is well known in the hardware, iron, tin plate and tinware manufacturing interests of this city and is a member of the firm of Holbrook, Merrill & Stetson. The declaration of principles says that the association is formed to promote the manufacturing interests of the Pacific Coast. It will extend all over the State and affiliate with similar organizations in other States. The directors shall have full power to act for the body as a whole. The rights of both employers and employees to organize are recognized. While respecting the right of employers to employ whom they please, they shall not refuse employment to any one because he is a member of a union. Condemning strikes and boycotts, the Board of Directors will endeavor to settle all such troubles by arbitration, and are empowered to act as an Arbitration Committee. The association now consists of 115 members.

The Engines of the Maine.

On last Monday the engines of the United States armored cruiser Maine were in operation at the Quintard Iron Works, N. F. Palmer, Jr., & Co., New York. The unusual opportunity of closely examining a moving marine engine of great power, placed in such a position that each individual part could be readily inspected, was taken advantage of by many naval engineers and mechanical experts. The engines were mounted in the large assembling room of the Quintard Works, in the same relative position they will occupy in the cruiser. The general design and arrangement of the engines were highly commended, and the builders were complimented upon the superiority of the workmanship. Of course the engines were not under steam, but were operated by small engines connected by suitable gearing with the shafts. This served every purpose and clearly showed the work each part performed.

Among those present were the Secretary of the Navy, Benjamin F. Tracy; Rear Admiral D. L. Braine, Commodore G. W. Melville, the Chief of the Bureau of Steam Engineering, designer of the engines; Medical Director A. L. Gihon, Lieut. William S. Cowles, commanding the Despatch; Chief Engineers S. L. P. Ayres, J. H. Chasmar, Charles H. Baker, G. W. Stivers, B. F. Isherwood, T. Zeller, Albert W. Morley, William W. Heaton, Jackson McElwell; Passed Assistant Engineers F. C. Bieg, W. N. Little and Albert F. Dixon; First Lieut. A. D. Littlefield, commanding revenue steamer Chandler; Chief Engineer D. C. Chester of the revenue cutter Grant, who was present to represent Capt. L. G. Shepard, Chief of the Revenue Marine, and to report to him on his observations; First Assistant Engineers W. F. Blakemore and Alfred Hoyt of the Revenue Marine; Assistant Engineers R. E. Carney, Andrew McAllister, W. P. Winchell, Emil Theiss, W. M. McFarland, Frank H. Conant, J. B. Patton and George W. Danforth; Lieuts. T. B. Howard and William P. White, and Ensigns J. L. Purcell and Houston Eldridge of the navy. Among the prominent civilians were General Superintendent Davis and

Head Draughtsman Meline of the Richmond Locomotive Works; Edward Cramp, from the Cramps' establishment; Irving M. Scott, general manager of the Union Iron Works of San Francisco; C. E. Emery, consulting engineer; Superintendent Taylor of the Fletcher Iron Works of New York; Superintendent Knapp of the Union Ferry Company; Messrs. Kennedy and Allen, from the Mutual Gas Works; Warren Hill and P. F. Howland of the Continental Iron Works; Chief Engineer J. C. Kafer of the Morgan Iron Works; A. B. Mills, M. Hertz, of Frankfort, Ind.; Superintendent Hammond, of the Buffalo Iron Works, and Superintendent Raynal of the Elizabethport Works.

Since we have in former issues of *The Iron Age* described in detail the hull and machinery of the Maine, it is only necessary to give here the principal dimensions. The hull was built at the Brooklyn Navy Yard, to which place the engines will be taken and placed on board. The length on load water line is 318 feet; breadth, 57 feet; mean draught, 21½ feet; displacement, 6648 tons. There are two triple-expansion engines, the cylinders of which are 35½, 57 and 88 inches in diameter, and the stroke 36 inches. The horse-power is 9000. The speed is 17 knots. The main battery will consist of six 6-inch B. L. R. and four 10-inch B. L. R., the secondary battery of eight 3-pdr. R. F., four 6-pdr. R. F., two 1-pdr. R. F., four 37 mm. R. C. and four Gatlings. The side armor is to be 11 inches thick, and the turrets and barbettes 10½ inches thick.

The Duty on Shotgun Barrels.

Before the United States General Appraisers at New York, August 8, 1891, in the matter of the protest, 10,558 a, of Messrs. Samuel Godwin's Sons against the decision of the Collector of Customs at New York as to the rate and amount of duties chargeable on certain so-called steel shot tubes or shotgun barrels, imported per Auranis, February 3, 1891, the following opinion by Wilkinson, General Appraiser, has been published:

The goods are shotgun barrels, and were assessed for duty at 45 per cent., under paragraph 215, N. T. The appellants claim that they are entitled to free admission under paragraph 702, which exempts from duty "shotgun barrels, forged, rough bored." The merchandise was returned for duty because, in the opinion of the appraiser, no further boring was required to fit the articles for use. While expert testimony shows that this point was not well taken, paragraph 702 is clearly inapplicable to the barrels in question, because they are not forged. In the manufacture of these articles by the Whitworth patent process, steel in its fluid state is pressed into short ingots. The ingots are drawn or rolled into the desired length and shape and then rough bored, making the barrels now under consideration. The claim of the appellants cannot be sustained, and the decision of the Collector is hereby affirmed.

The first carload order for American terne plates thus far placed in the Chicago market was taken last week by the Pittsburgh Electroplating Company, of which P. H. Laufman is president. The purchasers were John Johnston & Co., dealers in tinsmiths' and roofers' stock, 231 Lake street. These plates are double coated and were sold at a price somewhat lower than imported plates of similar quality, the makers guaranteeing to furnish two good plates for every defective one that might be found. The assortment consisted of 14 x 20, 20 x 28, and 20 x 56, in both IC and IX. The purchasers are advised that the carload was shipped from the works on the 27th. They have also ordered plates 30 x 96, which will be shipped later.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., September 2, 1891.

The shop trial of the engines of the Maine, which was had a few days ago at the works of their manufacturers in New York, is the theme of much interesting discussion in the Bureau of Steam Engineering of the Navy Department. Engineer in Chief Melville is particularly satisfied with the result. He has watched these engines with particular care from the moment their parts were reduced to paper by the experts and draftsmen through all the details of construction and witnessed the first revolution of their powerful but compact mechanism.

The compactness may be judged from the fact that the plant which is to move the mighty craft of war in water, weather and war will occupy but 20 feet square of space in the ship. Twenty-five revolutions to the minute, the minimum required, were reached with 50 pounds pressure of steam. The maximum required revolutions would have been 132.

The triple-expansion system which has been applied it is reported is a great success, and will lead to other important advances in the increase of power and capacity for speed in marine engines. The interchangeability of parts is also an important part. The cylinders are 35½, 57 and 88 inches in diameter. These engines are a great improvement in many essential respects on those on the other large vessels of the navy, and are in advance of the finest designs of foreign engines for similar purposes.

Captain Meade, formerly commandant of the Washington Navy Yard, and now in charge of the preparations of the naval exhibit at the Chicago World's Fair, is engaged in building a full size model of the armored cruiser Maine, in brick. A battle ship of brick is more suitable to the facilities of navigation in the Prairie State than the craft of metal, armored with great slabs of impenetrable steel. Captain Meade says that she will be very fast when she is finished. This baked clay monster of war will be 350 feet long.

F. L. Dickey, Secretary of the Iowa Iron Works Company of Dubuque, Iowa, passed through Chicago on Monday, on his way to Washington, to close a contract with the United States Government for the construction of a torpedo boat for ocean service. The company's bid was \$4000 lower than any of their competitors, notwithstanding their distance from the seaboard and from plate mills. The boat will be equipped with 1800 horse-power triple-expansion engines, and is to have a guaranteed speed of 24 knots, which Secretary Dickey is confident that his company can surpass. The Iowa Iron Works Company have built several steel boats this year, and are just completing a snag boat for the Government, for use on the Mississippi and its tributaries.

A movement is on foot to organize an association among the manufacturers of corrugated iron roofing, the object being to fix and maintain prices.

Carnegie, Phipps & Co. were the only bidders last week for supplying steel plates for the use of the navy, as follows: Ten 2½-inch plates for Cruiser No. 6, 12 cents per pound; eight 2-inch and 16 1-inch plates for Washington Navy yards, and six 1-inch plates, each for the Norfolk and New York Yards, 11 cents per pound.

MANUFACTURING.

Iron and Steel.

The Mahoning Valley Iron Company of Youngstown, Ohio, have leased the entire plant of the Wheatland Iron Company, at Wheatland, Pa. For some time the firm have been unable to secure sufficient muck bar to fill their orders and will at once start the puddling department in the plant of the Wheatland Iron Company, and will operate it until such time as the firm can make contemplated improvements at their present plant in Youngstown. The plant contains 13 puddling furnaces, all of which will be operated double turn by the Mahoning Valley Iron Company. In addition to muck iron, the firm turn out plates and angles for the four lightships being built for the Government in the shipyards of F. W. Wheeler & Co., at West Bay City, Mich. The Mahoning Valley Iron Company have secured contracts for about 1000 tons of this material.

M. V. Smith, metallurgical engineer, Hamilton Building, Pittsburgh, Pa., has received a contract to furnish six gas producers to be placed in the La Belle Steel Works of Smith Bros. & Co., in Allegheny City, Pa.

The following changes have been announced in the Edgar Thomson Steel Works of Carnegie Bros. & Co., Limited, at Braddock, Pa., and went into effect on September 1: Night superintendent John Hutzen has been appointed superintendent of the rail mill, and roller A. J. Boyle will be night superintendent. Hiram Hutzen has been appointed to fill the position of Mr. Boyle as boss roller. These appointments have all been made to fill the vacancy caused by the death of Captain Lapsley, who was superintendent of the rail mill from the time it was put in operation until his death.

Gem Furnace of the Shenandoah Furnace Company, Milnes, Va., blew out on the 26th ult. indefinitely.

At the present time quite a conflict is being waged between Moorhead Bros. & Co. of Pittsburgh, proprietors of the Vesuvius Iron and Nail Works at Sharpsburg, Pa., and the Amalgamated Association. It will be remembered that we printed some weeks since in these columns a statement issued by the above firm. Several conferences were held between the firm and the Amalgamated Association, and at one time it seemed as if the trouble would be satisfactorily arranged. However, this was not the case, and after giving the men warning that if they did not return to work their places would be filled by other men, the firm made preparations to start their plant with non-union men. At present the plate mill and several puddling furnaces are in operation.

The plant of the Columbia Iron and Steel Company at Uniontown, Pa., which was recently put in operation after a long idleness, caused by the assignment of the firm, is at present being operated only half time. The reason given for not operating the plant in full is that the firm have not sufficient capital, and an endeavor will be made to increase the capital stock to \$300,000. If this is done it is claimed the plant will be operated full time in all departments, as the firm report enough orders on hand to operate the plant to its full capacity.

H. Lloyd Sons Co., proprietors of the Kensington Iron Works at Pittsburgh, have applied for a charter for a corporation to be known as the H. Lloyd Sons Company. The object of making application for the charter is to change the firm from a partnership to a corporation.

Some weeks ago the blooming and converting departments of the plant of the Oliver Iron and Steel Company, on the south side, Pittsburgh, were closed down temporarily for repairs. It was expected that when these repairs were completed the plant would be put in operation. The firm have decided, however, to allow the plant to remain closed until an improvement in the iron business takes place, and with this in view all the former employees have been discharged, and at this time it is not known when the plant will go in operation.

In one day recently the Paige Tube Company, whose plant is at Warren, Ohio, shipped 400,000 feet of tubing. This is the largest shipment ever made by this firm in a similar period.

The new butt-weld tube department now being added to the plant of the Riverside Iron Works, at Wheeling, W. Va., will be ready for operation in about two weeks. The nail factory of this firm, which is second to the largest in the world, remains idle.

The blast furnace of the Bellaire Nail Works of Bellaire, Ohio, is now undergoing repairs,

which will include relining of the stack. The Bessemer steel plant of the firm is in constant operation, while their nail factory remains idle.

No. 1 Pioneer Furnace, at Thomas, Alabama, has blown in.

The McConway-Torley Company of Pittsburgh, manufacturers of malleable iron castings, have increased their steam capacity by the addition of a Babcock & Wilcox boiler, equipped with a Roney stoker, and they have also put in a Corliss engine of 150 horse-power. This firm have also recently placed in their works an Archer gas producer. In case it is found to work satisfactorily the firm will probably adopt the system throughout their entire plant and discard natural gas entirely.

Wages at the Colebrook furnaces, Lebanon, Pa., have been reduced 10 per cent.

The Southern Iron Company at Chattanooga are experimenting with the duplex process, having started their old, small Bessemer plant.

The trouble between the heaters in the mill of Summers Brothers, at Struthers, Ohio, and the company is adjusted.

The Latrobe Steel Works, Latrobe, Pa., have let contracts for building a plant for supplying the works with artificial gas. The company have been using natural gas, but it is reported that the supply is becoming scarce.

Fayette Brown, the receiver of Brown, Bonnell & Co., has filed his report with the Clerk of the United States Court for the month of July. It reads as follows: Balance on hand July 1, 1891, \$22,592.80; received in July, \$129,459.86; total, \$152,052.66; payments in July, \$119,531.04; balance on hand July 31, \$32,521.62.

The iron and steel mill at Canonsburg, Pa., which has been idle for some time, is now in full operation.

Coates & Co. of the Locust Point Iron and Steel Works, Baltimore, Md., inform us that they are erecting two mills for the manufacture of tin plate, with a capacity of 1500 boxes per week. The engine power is for six mills, but owing to the uncertainty as to whether the present tariff will be sustained, they are going ahead rather slowly. They expect to be making plates in 90 days.

The Braddock Wire Works in Pittsburgh are closed down to admit of the furnaces being changed to burn coal. It will take about six weeks to effect the change. Other firms are making a similar change.

Vesta Furnace, at Marietta, Pa., has been blown in.

Preparations are being made to put stack No. 1 of the Lehigh Iron Works, at Allentown, Pa., in blast at once.

G. W. Goddard is the promoter of a rolling mill at Berkley, Va.

Machinery.

The McIver Bros. Machine Company, manufacturers of wood-working machinery, at Worcester, Mass., have been petitioned into insolvency. It is stated that trouble has existed among the stockholders for some time, and this course was adopted to adjust the difficulties. The liabilities of the company are said to be between \$30,000 and \$40,000.

The Ball Engine Company, Erie, Pa., have opened a branch office in Chicago in the Rookery Building, Room 606. Albert Fisher has been appointed manager.

The Betts Machine Company, Wilmington, Del., have recently shipped four special tire boring mills to the Standard Steel Works, Lewistown, Pa., and one of their heavy 10 x 16 feet turning and boring mills to Mackintosh, Seymour & Co., engine builders, Auburn, N. Y.

At Pottstown, Pa., the Pottstown Special Machine Company have been recently organized.

The Lewis Foundry and Machine Company, Limited, builders of rolling mill machinery, shipped during the present week a 22-inch skelp mill to the Benwood Iron Works, at Wheeling, W. Va. This mill is intended to roll as wide as 29½-inch steel grooved skelp plate, and the rolls that go with the mill are designed for 22½-inch plate. The mill is equipped with a set of automatic tables designed by Wm. H. Maddock, and will be among the most complete of its kind in the country. Among recent shipments made by the Lewis Foundry and Machine Company, Limited, are three 5-ton swing cranes, two 16-inch Frank patent hydraulic cranes and one 24½-inch accumulator, all for the new plant of the Washburn & Moen Mfg. Company now being erected at Waukegan, Ill. Also a 22,000 pound shear

and engine for the Richmond Locomotive Works, at Richmond, Va., and a special saw band rolling mill for Singer, Nimick & Co., at Pittsburgh. The firm report plenty of orders on hand, especially for rolling mill machinery, and are operating their plant the whole time.

The foundry of Henry Glocker & Co., Grand Haven, Mich., has been destroyed by fire.

C. J. McKenzie of Wauseon, Ohio, is authority for the report that works for the manufacture of pumps are to be built at Toledo, Ohio.

Capital for the reorganization of the Taylor Mfg. Company, at Chambersburg, Pa., has been raised.

Thomas McGarigle and John Sweeney have purchased Phillpot & Leupp's old machine shop at Niagara Falls, N. Y.

The Birmingham Iron Foundry of Birmingham, Conn., are making 25 mills for the American Ore and Machine Company. Ten have already been made for the company.

The Vulcan Iron Works will erect a new boiler shop at West Pittston, Pa.

The Malleable Iron Works at Superior, Wis. made their first cast recently.

J. P. Speirs & Co. of Worcester will build a large shop for the manufacture of bicycles.

Andrew Hume is about to start a foundry at Brewster, N. Y.

Miscellaneous.

The Oliver Coke and Furnace Company of Pittsburgh, who have been recently granted a charter of incorporation, propose to build 300 coke ovens near Uniontown, Pa. The output will be used by the Oliver Iron and Steel Company at their Edith Furnace in Allegheny and Rosena Furnace at New Castle, Pa., which is operated under lease by this firm. In case the output cannot all be consumed at these two furnaces, the coke will be placed on the market. The new company are composed of David B. Oliver, Henry Roberts, Jas. B. Oliver, Stephen W. Tener and Chas. D. Frazer, all of Pittsburgh.

Simultaneously with the announcement of the incorporation of the Ludlow Valve Mfg. Company, under the laws of New Jersey, with a capital of \$700,000, for the purpose of manufacturing valves and hydrants at Montclair, N. J., comes the report that the stockholders of the company have signed an agreement to transfer their stock to an English syndicate for \$900,000.

The Coil Bending Company are running at Melrose, Mass.

The plant of the Walton Architectural Iron Company at Covington, Ky., is nearing completion.

Cast Pipe Freight.

The Southern Railway and Steamship Association have established the following rates of freight in effect September 5, 1891, on cast-iron pipe, carloads, released, from Bessemer, Ala.; Birmingham, Ala.; Anniston, Ala., and Chattanooga, Tenn.

To	Per 100 pounds.
Atlanta, Ga.....	\$0.10
Augusta, Ga.....	.15
Athens, Ga.....	.15
Brunswick, Ga.....	.14½
Charleston, S. C.....	.14½
Columbus, Ga.....	.14
Fernandina, Fla.....	.14½
Griffin, Ga.....	.15
Jacksonville, Fla.....	.14½
Macon, Ga.....	.14
Port Royal, S. C.....	.14½
Savannah, Ga.....	.14½
Washington, Ga.....	.18
Baltimore, Md., via all rail.....	.26
Baltimore, Md., via rail and water.....	.24
Boston, Mass., via all rail.....	.29
Boston, Mass., via rail and water.....	.27
New York, N. Y., via all rail.....	.29
New York, N. Y., via rail and water.....	.27
Philadelphia, Pa., via all rail.....	.29
Philadelphia, Pa., via rail and water.....	.27

It will be observed that these rates are only about \$1.42 above pig-iron rates.

The first consignment of tin in any bulk from mines on this continent is now on the way to Pittsburgh from the mines of the Pittsburgh and Mexican Tin Company, in Durango, Mexico. The shipment is one of 20 tons.

TRADE REPORT.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street,
CHICAGO, September 2, 1891.

General business continues to improve, and prospects grow brighter from day to day. Inquiries are coming forward for deliveries next year from parties whose immediate necessities have been provided for, and who would cover next year's requirements if they could do so at present prices. All the soft spots in the market have not yet been eliminated, however, and the anomaly is presented of some manufacturers asking an advance, while others are making absurdly low rates. The tightness of money in some quarters is probably the explanation of this singular weakness in the face of an improving condition of trade.

Pig Iron.—The situation was so thoroughly described in last week's report that there is little to say now. Sellers do not call the market active, and say they are having but a fair trade, yet the aggregate business reported covers several thousand tons of all grades and kinds of Iron. Up to last year this would have been considered a very good week's business, but comparisons are now made with last year's heavy trade, and, of course, unfavorably. A peculiar feature of business now is that without much figuring and very little preliminary skirmishing buyers keep steadily entering the market and placing orders. An advance of 25¢ on Ohio Irons would not be surprising, as freight rates were marked up on the 1st. A few sales of Southern Coke Iron are reported at concessions, but special circumstances governed the prices made and general quotations are not affected. Sellers of Lake Superior Charcoal are firmer in their views, as the output of the furnaces is well sold up. Spiegel is unchanged, but local manufacturers are not now offering Ferro. We quote as follows, f.o.b. Chicago:

Lake Superior Charcoal.....	\$17.25 @	\$18.00
Local Coke Foundry, No. 1.....	16.00 @	16.50
Local Coke Foundry, No. 2.....	15.00 @	15.25
Local Coke Foundry, No. 3.....	14.50 @	15.00
Local Scotch.....	16.00 @	16.50
Ohio Strong Softeners.....	17.75 @	18.25
Southern Coke, No. 1.....	15.75 @	16.25
Southern Coke, No. 2.....	15.00 @	15.25
Southern Coke, No. 3.....	14.50 @	15.00
Southern, No. 1, Soft.....	15.00 @	15.75
Southern, No. 2, Soft.....	14.50 @	14.75
Southern Gray Forge.....	14.00 @	
Southern Mottled.....	13.50 @	14.00
Tennessee Charcoal, No. 1.....	18.00 @	
Alabama Car Wheel.....	20.50 @	21.50
Coke Bessemer.....	@	
Hocking Valley, No. 1.....	17.00 @	18.50
Jackson County Silvery.....	17.50 @	18.00

Bar Iron.—The inquiry lately has been almost entirely for immediate shipment, which few works are able to guarantee. All the small mills seem to be filled for the time being and are out of the market. Prices are now well established at 1.70¢ @ 1.75¢, half extras, Chicago, for mill lots.

Structural Iron.—A great deal of work was entered last week, covering both buildings and bridges. The American Bridge Works of this city secured the Odgen avenue viaduct at \$118,320 for the superstructure. Other large transactions are coming forward. A very heavy trade is being done in Beams and other shapes from stock. Mill lots are quoted at 2.15¢ for Angles, 2.60¢ @ 2.70¢ for Tees, 2.20¢ @ 2.25¢ for Sheared Steel Plates, and 3.20¢ for Beams and Channels, Chicago delivery.

Plates.—Large orders are not numerous as yet, but the volume of small orders is large and increasing daily. Consumers in various sections are making up stock

orders and sending them in, evidently anticipating a rush of work. Prices from store are unchanged, but low rates are again being made by some mills for desirable orders and prompt shipment.

Sheet Iron.—The jobbers have cut prices the past week, selling No. 27 Common down to 3¢ for lots of a few bundles from store. It is claimed, however, that before this week ends they will restore rates to 3.20¢, as mills are not making deliveries promptly on old contracts and purchases are being made from other mills at considerably advanced prices to meet the current demand. Manufacturers are firm, and not many are in a position to handle orders for early delivery. They quote 2.95¢, Chicago, on such business as they can take care of. Galvanized Iron is firmer. The demand has lately been very heavy, and warehouses show broken stocks again. Some manufacturers now name 67½¢ as their lowest discount on Juniata to largest trade. Jobbers continue to quote this price also.

Merchant Steel.—The general Steel trade is rather quiet, as was to be expected after the season orders were placed. Tool Steel is a little lower, and is now selling at 6¢ @ 6½¢ and upward, according to quantity and quality. Open-Hearth Spring has given way under the pressure to sell by some makers. Carload lots from mill are quoted at 2.20¢ @ 2.25¢, Chicago, but season contracts have been made at 2.05¢. Machinery Steel is better sustained, and is quoted at 2½¢ from mill. Bessemer Bars sell at 2.15¢ from stock, but large orders sell at special prices, varying with the transactions.

Track Supplies.—Steel Rail orders come in just as they have been doing for some time, generally small, with a few running over 3000 tons booked the past week. Indications point to a steady trade in this way, with perhaps a spurt in October or November, as winter approaches. A disposition is noted on the part of leading railroads to make inquiries for next year's delivery, but manufacturers are not yet ready to make terms. They quote \$31.50 @ \$32, according to the character of the order. Quite a number of Splice Bar orders are talked of, which may develop into business before long. They are quoted at 1.85¢, but have probably been sold a little lower. Small Spikes are active, but Standards are comparatively quiet, with prices firm at 2.20¢ @ 2.25¢, and intimations that they will soon be marked up. Bolts are weak, but are still quoted 2.80¢ @ 2.90¢.

Old Rails and Wheels.—Old Iron Rails have been quiet. Sellers ask \$23, and buyers bid \$22.50 @ \$22.75. Old Steel Rails are nominally quoted \$14 @ \$16, according to length, but the market for all kinds of Steel Scrap is very dull. Old Car Wheels are in demand, but are apparently not plentiful. Stocks were supposed to be large, but there is not a heavy supply visible. They are quoted at \$16, but some sellers ask more.

Scrap.—In the absence of transactions, prices are nominal. It would be hard to realize 50¢ a ton under last week's quotations.

Metals.—Lake Copper is firmer; carload lots are still quoted at 12½¢, but the market looks as though it would advance. Casting Copper fell off a little, early last week, but reacted, and is now quoted at 12¢ @ 12½¢. The demand for Spelter is light, as consumers are well covered. Quotations for carloads range from 4.85¢ to 4.95¢. In Pig Lead a decided change came over the market during the past week. Business at first was very dull, but gradually an inquiry for spot and September developed, and before the week ended about

1000 tons were sold to consumers at 4.27½¢ @ 4.30¢. From 4.30¢ to 4.35¢ is now asked.

F. A. Mann has been appointed Western manager of Russell, Burdall & Ward, to succeed the late Charles T. Blackwell. Mr. Mann had previously been connected with the Upson Nut Company's Cleveland house and is well and favorably known throughout the Western Nut and Bolt trade. He will continue the firm's Western offices at 59 Dearborn street, Chicago.

John A. Green has been appointed manager of the Chicago branch of Park, Bro. & Co., Limited, 243 and 245 Lake street, to succeed Charles Barnes, whose resignation took effect on September 1. Mr. Green was formerly with the Sanderson Bros. Steel Company of Syracuse, N. Y.

Nelson B. Williams, manufacturers' agent, representing a number of very important interests in the line of Sheet Iron and Steel, Galvanized Iron, Wire and Cut Nails, &c., has removed his offices from the Rookery Building, Chicago, to his warehouse at the corner of Sixteenth street and Newberry avenue.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa., September 1, 1891.

The ninth month opens with a much better feeling than at any previous time in the year, although prices are probably at the lowest point recorded during that period. There is not even an attempt for better prices, the main point for the present being to secure plenty of work. Every one feels confident of a vastly improved condition of affairs before long, but in the meantime the disposition is to get in shape for it. More or less disorganization has taken place during the past eight or nine months, working forces have been cut down, and half or three-quarter time has been the rule with but few exceptions. Now, however, there is a desire to put things into first-class working order, so that when business begins to crowd in manufacturers will be in a position to handle it. Hence the matter of a slight concession in price is no serious objection to such concerns as these, although, of course, the ultimate object is, as may be expected, personal advantage. There appears to be no other satisfactory explanation, and especially so as there is not only very little grumbling, but on the contrary an abiding confidence that the present low prices will soon give way to much better figures as well as a much larger business.

Pig Iron.—The demand is a trifle larger, and at concessions from quoted rates, heavy sales could be made, but at the low prices now ruling business on such terms is not sought for. In exceptional cases buyers may secure a lot of that kind, but as a rule prices are steady and the supply of standard brands not in excess of the demand. At the same time it must be conceded that there is plenty of Iron at low prices, say \$14, \$15.50 and \$16.50 at Philadelphia for the three leading grades, although the best Virginia Irons command prices equal to Pennsylvania brands, which are 25¢ @ 50¢ more for Mill Irons and \$1 @ \$1.50 more for Foundry Irons than the figures quoted for ordinary Southern Irons. Hence the range of prices is wider than usual, with more pressure at the inside figures than at the higher rates, for the reason that low-priced Irons can only be placed in large blocks, while the demand for other descriptions is continuous, and although the lots taken are usually small, the aggregate business is large enough to absorb pretty much the entire output of that class of Iron. As regards the immediate

outlook, there is nothing to show that prices are likely to change very much, but every one recognizes the fact that higher prices must be the ultimate outcome, but how long before that period is reached no one can say. As yet there is no general attempt to take on large lines, although a few leading buyers have been bidding about 25¢ below the market for good sized lots, but even this was in a kind of listless, half-hearted way, as though they did not care whether they got what they bid for or not. Indeed, it is safe to say that the desire to buy in advance of requirements has not manifested itself very strongly in any direction, and until it does there can be no great change in prices. On the other hand, sellers are almost equally indifferent, unless it may be someone with a lot of inferior iron on hand, or for a grade for which there is no particular call. For all practical purposes, therefore, the market is about the same as for weeks past, the only difference being that prospects are improving. Sales chiefly at about the following prices, according to brand, point of delivery, &c.

Ohio Softeners, No. 1x.....	\$19.00 @
Ohio Softeners, No. 2x.....	18.00 @
Standard Penna. No. 1x.....	17.75 @	\$18.00
Standard Penna. No. 2x.....	16.25 @	16.75
Medium Penna. No. 1x.....	17.25 @	17.50
Medium Penna. No. 2x.....	16.00 @	16.25
Virginia, No. 1x.....	16.50 @	17.25
Virginia, No. 2x.....	15.50 @	16.00
Standard Neutral All-Ore Forge	14.25 @	14.75
Ordinary Forge Cinder mixed ..	13.75 @	14.00
Hot-Blast Charcoal.....	20.00 @	22.00
Cold-Blast Charcoal.....	24.00 @	27.00

Ferromanganese.—There are buyers of 80 % at about \$63.50, duty paid, but sellers ask \$64.50, with some chance of business at a medium quotation.

Steel Billets.—Market somewhat more active, but at low and unsatisfactory prices. Sellers quote \$27 at points on the Susquehanna, and from that to \$27.75, delivered at seaboard, but actual business has been done at lower figures than these. In one or two instances Billets have been refused at \$27.40, delivered to mills on the Schuylkill, and it is thought that firm offers at \$27.25 would take them, although no one cares to bid that figure except for small lots. Business looks like more activity, but at low figures.

Steel Rails.—The outlook is growing very much brighter, and it is felt that the time is not far distant when the mills will be crowded with work. Meantime orders are being taken at \$30 at mills, with no recent transactions of special importance.

Muck Bars.—The market is in a very unsatisfactory condition, and prices difficult to quote. Some are offering at \$26.75, delivered, others refuse \$27, while some large consumers say that \$26.50 is all that they will pay, and that they are getting good Bars at that price, delivered.

Bar Iron.—The demand has not assumed large proportions, but there is a better feeling, and somewhat more business around. Prices, however, are very unsatisfactory, 1.65¢ @ 1.70¢ at interior point, or 1.70¢ @ 1.75¢ at seaboard. Some mills claim to be getting better prices than these, but while that is probably true the great bulk of the business is at the inside figures, with no immediate prospect of improvement. Mills that have been making a very small output during the past couple of months are now prepared to run full, and are therefore competing sharply for whatever business is presented to them.

Skelp Iron.—The demand is still quite small, and prices are barely steady at 1.70¢ @ 1.75¢, delivered, with several sales at a medium figure.

Plates.—There is little or no change to note in this department. Mills are getting in a good deal of work in a small way, but large orders are conspicuously absent.

Prices are unchanged, and on anything that is desirable very low figures are made. Ordinarily asking prices are about as follows, delivered:

	Iron.	Steel.
Tank Plates.....	1.90 @ 2.00¢	2.00 @ 2.10¢
Refined.....	2.20 @ 2.30¢	2.10 @ 2.20¢
Shell.....	2.30 @ 2.40¢	2.40 @ 2.50¢
Flange.....	3.20 @ 3.30¢	2.50 @ 2.75¢
Fire-Box.....	4.00 @ 4.25¢	3.00 @ 3.50¢

Structural Material.—Business about holds its own, and the general position may be called unchanged. Some of the mills are running quite full in all their departments; others are less favorably situated, but there is a good deal of confidence in regard to the ultimate outcome, although as yet there are no inquiries to indicate any immediate change for the better. Prices about as follows: Angles, 2.05¢ @ 2.10¢; Sheared Plates, 2¢ @ 2.10¢, and 10¢ @ 15¢ more for Steel, according to requirements. Tees, 2.5¢ @ 2.6¢; Beams and Channels, 3.1¢ for either Iron or Steel.

Sheet Iron.—There is an improved demand for all descriptions, but particularly in Light Sheets, which are in active request. Mills are running to their fullest capacity, and are likely to have all the business they can handle during the balance of the year. Prices are unchanged, but show more uniformity than for some time past, and for best makes are quoted as follows:

Best Refined, Nos. 14 to 20.....	3.00¢ @ 3.10¢
Best Refined, Nos. 21 to 24.....	3.10¢ @
Best Refined, Nos. 25 to 26.....	3.20¢ @ 3.30¢
Best Refined, No. 27.....	3.40¢ @
Best Refined, No. 28.....	3.50¢ @
Common, ½¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3¢ @ 3¼¢
Best Soft Steel, Nos. 21 to 24.....	3¼¢ @
Best Soft Steel, Nos. 25 to 26.....	4¢ @
Best Soft Steel, Nos. 27 to 28.....	4¢ @
Best Bloom Sheets, ¼¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	@ 67½ %
Common, discount.....	@ 70 %

Old Material.—There is a firmer feeling on everything, some holders not being inclined to accept ruling prices, which are nominally as follows: Iron Rails, \$21.50 @ \$22.50; Steel Rails, \$17.50 @ \$18.50; No. 1 Railroad Scrap, \$20.50 @ \$21.50, Philadelphia, or for deliveries at mills in the interior \$21 @ \$21.50, according to distance and quality; \$15 @ \$16 for No. 2 Light; \$14 @ \$15 for best Machinery Scrap; \$13 @ \$14 for ordinary; \$15 @ \$16 for Wrought Turnings; \$10 @ \$10.50 for Cast Borings, and nominally \$24 @ \$25 for Old Fish Plates, and \$16 @ \$17, delivered, for Old Car Wheels.

Wrought-Iron Pipe.—There is no change of any importance to notice. Prices are weak and irregular, and with only a very moderate demand. Nominal discounts are as follows:

Butt-Welded Black.....	52½ %
Butt-Welded Galvanized.....	42½ %
Lap-Welded Black.....	62½ %
Lap-Welded Galvanized.....	50 %
Boiler Tubes, 2½ inch and under.....	52½ %
Boiler Tubes, 3 to 6 inch.....	60 %
Boiler Tubes, 7 inch and larger.....	55 %

Louisville.

LOUISVILLE, Ky., August 31, 1891.

Pig Iron.—The improvement in the Iron business noted in our last report seems to be gaining ground and becoming more generally felt over the country. There is a greater inquiry apparent, and buying is a shade more free. The indications now are that the great activity predicted for this fall and winter in all branches of the Iron trade may shortly be realized, and that there will be a revival of business before a great while. The railroads throughout the country are being greatly benefited by the movements of farm products, as indicated by the enormous increase in traffic and their

large earnings. Bar Iron has moved up slightly in the West, and sales have been made at the advanced price. Furnaces seem to be taking things quietly, not specially pushing their product on the market, and prices remain in about the same condition as noted for some time past. We quote for cash, f.o.b. cars Louisville:

Southern Coke, No. 1 Foundry....	\$14.50 @ \$15.00
Southern Coke, No. 2 Foundry....	13.75 @ 14.25
Southern Coke, No. 3 Foundry....	13.25 @ 13.75
Southern Coke, Gray Forge.....	12.75 @ 13.25
Southern Charcoal, No. 1 Foundry	16.00 @ 17.00
Southern Car Wheel, St'nd br'nds	19.00 @ 20.00

Cincinnati.

(By Telegraph.)

Office of The Iron Age, Fourth and Main Sts., (CINCINNATI, September 1, 1891.)

Pig Iron.—The past week has been an unusually quiet one. The sales were confined to small lots of the various kinds, and while buyers are willing to pay previous prices for what they require for current consumption, they will not anticipate their necessities even at any concession which it would be possible to obtain. On the other hand, the furnaces are not disposed to urge stocks upon an unwilling market, and as a rule will not entertain deliveries beyond this year. There is little surplus iron other than Gray Forge and No. 3 Foundry, and prices for these brands are so low that further concessions would cut close to the quick. There have been some inquiries for round lots of iron for forward delivery, but it was apparently more to develop the views of sellers than because actual purchases were contemplated. There is little indication of any enlargement in the consumption of iron. One railroad has placed orders for 1000 new cars, but divided them up between four or five shops, so that little impression is made upon the iron market. Pipe works are running to little more than half their capacity, and while there is a better prospect ahead, there is no indication of immediate improvement. It is something gained over the depression which has existed for several months to have an undertone of confidence in better things for the future, but that anticipation is not likely to be realized during the present year. Quotations remain as follows:

Foundry.

Southern Coke, No. 1.....	\$14.75 @ \$15.00
Southern Coke, No. 2.....	13.50 @ 13.75
Southern Coke, No. 3.....	13.00 @ 13.25
Ohio Soft Stone Coal, No. 1.....	16.50 @ 17.00
Ohio Soft Stone Coal, No. 2.....	15.50 @ 16.50
Mahoning and Shenango Valley.....	17.00 @ 17.50
Hanging Rock Charcoal, No. 1.....	20.00 @ 21.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 20.00
Tennessee and Alabama Charcoal, No. 1.....	16.00 @ 17.00
Tennessee and Alabama Charcoal, No. 2.....	15.00 @ 16.00

Forge.

Gray Forge.....	12.50 @ 12.75
Mottled Neutral Coke.....	12.00 @ 12.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	19.25 @ 19.75
Hanging Rock, Cold Blast.....	25.00 @ 26.00
Lake Superior Car Wheel and Malleable.....	18.00 @ 18.50

Detroit.

WILLIAM F. JARVIS & Co., Detroit, Mich., under date August 31, say: The general situation remains dull and unchanged, and while nearly featureless, the steady undercurrent of small orders is occasionally disturbed by a good-sized deal. We know of two transactions closed for 1000 tons each Lake Superior Iron, for delivery before the close of navigation, and the number of inquiries seen for additional lots should show a more active market for the first week of September. Southern furnaces have been hurrying forward all of the iron possible for their Northern consumers, owing to an advance in freights of 15¢ per ton the present week. This was generally on old orders, how-

ever, very little new business being developed. While as yet no improvement whatever is seen in prices, the continued favorable crop reports, the revival to a certain extent of stock speculation, the necessarily large business during this fall and winter of the railroads, lead our furnacemen to believe that a change for the better is not now far off. The market is as follows:

Lake Superior Charcoal, all numbers.....	\$18.00 @ \$18.50
Lake Superior Coke, Bessemer.....	17.75 @ 18.50
Ohio Blackband (40 per cent.)....	18.00 @ 18.50
Lake Superior Coke Foundry, all ore.....	17.50 @ 18.00
Southern No. 1.....	16.25 @ 16.50
Southern Gray Forge.....	14.00 @ 14.50
Jackson County (Ohio) Silvery.....	18.00 @ 18.50

Pittsburgh.

Office of The Iron Age, Hamilton Building, Pittsburgh, September 1, 1891.

Pig Iron.—There is no doubt that consumption is on the increase, and, notwithstanding production is large, there does not appear to be any accumulation of stock in first hands. There is little or no Iron being offered here from a distance, and home furnacemen have a virtual monopoly of the market. Prices as compared with those of a week ago remain unchanged, but a firmer feeling obtains, and it appears to be very generally conceded that there is not much risk in buying at present prices, which we quote as follows:

Neutral Gray Forge.....	\$13.75 @ \$14.00, cash.
White and Mottled.....	13.00 @ 13.50, "
All-Ore Mill Iron.....	14.50 @ 15.00, "
No. 1 Foundry.....	16.25 @ 16.50, "
No. 2 Foundry.....	15.25 @ 15.50, "
No. 3 Foundry.....	14.75 @ 15.00, "
No. 2 Charcoal Foundry.....	20.50 @ 21.00, "
Cold-Blast Charcoal.....	25.00 @ 27.00, "
Bessemer Iron.....	15.75 @ 16.00, "

In regard to Bessemer Iron, while some few sales have been reported at \$15.50, cash, \$15.75 @ \$16.00 are much nearer the market, and furnacemen claim that there is little or no margin for profit at the prices named. It is believed by some well informed operators that there is a movement on foot to bear the market for Bessemer Iron. For Mill Iron the market is steady at \$13.75 @ \$14, cash.

Muck Bar.—The demand continues light, with most of the business reported at prices ranging from \$26.25 to \$26.50, cash. Some sales were reported at \$26.65 @ \$26.75, but \$26.50 appears to be regarded as the top of the market.

Manufactured Iron.—The demand for all kinds of Finished Iron continues to increase and the mills here are all pretty fully employed. Some of them have more than they can do, and the indications are that there will be a good, healthy trade until the close of the year. Manufacturers continue to complain that prices are very close, the result of an active competition, but this is not confined to the Iron business. We continue to quote city made Iron at 1.70¢ @ 1.75¢ for Bars; 2.05¢ @ 2.10¢ for Plate and Tank Iron, and 2.70¢ @ 2.75¢ for No. 24 Sheet, all 60 days, 2 % off for cash. At valley mills Bars are quoted at 1.60¢, half extras. Skelp Iron still quotable at 1.65¢ for Grooved and 1.90¢ for Sheared.

Structural Material.—The activity noted in our last report continues and mills have all they can do, indeed they are pushed right and left to meet the demands made upon them. Prices are firm as quoted: Channels and Beams, 3.10¢; Sheared Bridge Plates, 2.15¢ @ 2.20¢; Angles, 2¢; Tees, 2.60¢; Universal Mill Plates, Iron, 2.05¢; Refined Bars, 1.80¢ @ 1.85¢.

Manganese.—Domestic 80 % Ferro is still quoted at \$66.50, cash. The market is firmer, but consumers have no trouble in being supplied at the price quoted.

Nails.—There is a fair business reported in Wire Nails, but prices show no improvement; \$1.90, 60 days, 2 % off for cash, f.o.b. at factory, is regarded as the ruling price for large orders, but there is a bare possibility that the price quoted might be shaded for a very desirable order, although some of our manufacturers aver that \$1.90 is the best they will do under any circumstances, and they claim that at this price there is very little margin. Cut Nails are still quoted at \$1.55 @ \$1.60, for 30 average. There is still considerable contention between the manufacturers of Wire and Cut Nails, and while it is admitted that the Wire Nail has made considerable headway within the past year or two, the Cut Nail manufacturers still aver that sooner or later the Cut Nail will again supplant the Wire Nail.

Barb Wire.—There has been no change in prices. In this district Painted is still quoted at \$2.75 in car lots and \$2.80 for less; Galvanized at \$3.25 in car lots and \$3.30 for less, f.o.b. A fair business is reported, but there appears to be a disposition, it is said, on the part of large buyers, to hold off in order to ascertain whether or not the present syndicate prices are likely to be maintained.

Steel Plates.—There is no improvement in demand; business in this line has been dull for some time past, and about all the mills have to do is working up old orders. Prices unchanged: Fire Box, 3.90¢ @ 4.25¢; Tank, 2.10¢; Shell, 3.35¢; Flange, 2.55¢.

Wire Rods.—There have been no sales reported for several weeks, in the absence of which we quote nominally at \$34 @ \$35, f.o.b. at maker's mill. Consumers appear to be pretty well supplied for the present, and makers are also pretty well sold up, and this we apprehend accounts for the fact that there has been so little new business of late.

Wrought Iron Pipe.—There has been nothing new developed in this important branch of the Iron business during the past week; business, while not up to what it is at this season of the year, is all possibly that can be expected, and there will likely be a fair degree of activity until the close of the year. Prices remain unchanged. Discount on black Butt Pipe, 52½ %; on galvanized do., 42½ %; on black Lap, 62½ %; on galvanized do., 50 %; Boiler Tubes, up to 2½ inch, 55 %; 3 to 6 inch inclusive, 60 %; 7 inch and larger, 55 %; Casing, all sizes, 55 %.

Old Rails.—There is still considerable inquiry for Old Iron Rails, chiefly from consumers in the Mahoning and Shenango valleys. There has been no demand for them here for a couple of years past. May be quoted at \$23.50 @ \$24. No sales reported above \$23.50, but some holders are now asking \$24. There has been very little call of late for Old Steel Rails, and there have been no sales reported for several weeks.

Merchant Steel.—There is a fair demand reported, but prices remain unchanged as follows: Crucible Tool Steel, 6½¢ @ 7¢; do. Spring, 4¢; do. Machinery, 4½¢ @ 5¢; Bessemer Spring Steel, 2.50¢; do. Machinery, 2.40¢ @ 2.50¢; do. Toe Calk, 2.50¢; Tire Steel, 2.20¢; Steel Bars, 1.80¢ @ 1.85¢ rates, full extras. As stated in a former report, Steel Bars are for many uses supplanting Iron.

Billets and Slabs.—Most of the business reported was at \$25, cash, at makers' mill, which is now regarded as the ruling price for large lots. Small lots, \$25.25 @ \$25.50, delivered to city consumers.

Railway Track Supplies.—Mills are all reported busy. Spikes have been reduced in price to 2.10¢, 30 days, f.o.b. at

makers' works. Splice Bars are also lower, and we now quote at 1.75¢ @ 1.80¢. Track Bolts remain unchanged at 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

Steel Rails.—There is a fair business reported in the local market, with no change in price, which we continue to quote at \$30, cash, f.o.b. at mill.

Old Material.—There was very little new business reported the past week; prices remain about as last quoted. Sales No. 1 R. R. Wrought Scrap at \$19 @ \$19.50, net ton; Cast Scrap, \$13.50 @ \$14, gross. Sale of 500 tons Steel Rail Ends at \$17.50, gross.

Coke.—There is no change in prices; demand keeps up fairly well, and large shipments are being made in all directions.

Cleveland.

CLEVELAND, August 31, 1891.

Iron Ore.—The few sales of Ore that have been made during the past week have been at an advance over early season quotations of a sum nearly equal to the increase in transportation rates. The market itself is, of course, quiet, buyers believing that there is no likelihood of further advances and that there need be no haste about filling out stocks. A few thousand tons of Non-Bessemer Hematites have been let go at a price equivalent to \$3.75, f.o.b. vessels Cleveland. Gogebic Bessemer are worth \$4.60 @ \$4.75. Over 40,000 tons of Ore have been forwarded to the furnaces from Cleveland during the past week, an increase of 10,000 tons over the shipments for the corresponding week in 1890. The total amount sent down to the furnaces from all lake ports during the week just closed is close upon 85,000 tons. The receipts of new Ore at Cleveland during the past seven days amount to 84,000 tons, and at all lower lake ports combined about 260,000 tons, an increase of 40,000 or 50,000 tons over the receipts for the same week last year. The amount of unsold Ore being sent down from the mines is insignificant, it seeming to be the purpose of both buyers and sellers to clear up business and begin the season of 1892 with a brand new set of books. Some buying is anticipated in September, as quite a quantity of Ore must still be bought by some of the furnacemen east of the Alleghenies. Lake freights are unchanged at 90¢ from Escanaba, \$1.05 @ \$1.10 from Marquette and \$1.15 from Ashland.

Pig Iron.—Although little if anything is being done, a very hopeful view is taken of the situation and of the future. It is believed that there will be a good buying movement in September and October. Dealers say the demand for Iron is good and is improving daily. The furnaces are well occupied with orders, and there is no likelihood of any idleness for some time to come. Local quotations are as follows:

Nos. 1 to 6 Lake Superior Charcoal	\$18.50 @ \$19.00
Nos. 1, 2 and 3 Bessemer, per ton.....	16.00 @ 16.25
No. 1 Strong Foundry, per ton.....	16.25 @ 16.75
No. 2 Strong Foundry, per ton.....	15.25 @ 15.75
No. 1 American Scotch, per ton.....	16.80 @ 17.00
No. 2 American Scotch, per ton.....	15.80 @ 16.85
No. 1 Soft Silvery, per ton.....	16.50 @ 17.50
Mahoning and Shenango Valley Neutral Mill Irons, per ton.....	14.00 @ 14.50
Mahoning and Shenango Valley Red Short Mills, per ton.....	14.00 @ 14.50

Nails.—The market is a little easier and Steel Wire Nails 5¢ lower, being quoted at \$2.05. Steel Cut Nails are still quoted at \$1.70, in stock.

Old Rails.—Not very much is doing. No sales are reported, and prices are nominally given on the basis of \$22.50 for Old Americans.

Bar Iron.—The demand is reported as extraordinarily heavy and the mills are well supplied with work. Prices are unchanged at 1.70¢ from the mills.

Scrap.—The market is rather dull, prices being quoted on the basis of \$19.50 for No. 1 Wrought.

New York.

Office of *The Iron Age*, 96-102 Reade street, NEW YORK, September 2, 1891.

In all branches of the Iron trade there is a distinctly hopeful feeling. As yet there has been little actual increase in business, but there is unquestionably a stronger feeling in some lines, expressed chiefly through the fact that sellers will not at the slightest sign of resistance on the part of the buyer abandon the position taken by them and make efforts to capture business by prompt concessions. It is beginning to happen that a seller has an ultimatum and stands to it. The only fact which causes uneasiness is the report of sales of Steel Billets at low figures by a leading Pittsburgh maker.

American Pig.—While there is a fair inquiry for Foundry Irons, Forge grades are dull. There have been some sales, in round lots, of Michigan Charcoal Iron on the basis of \$17.50, Buffalo. Northern brands are quoted at \$16.75 @ \$18 for No. 1; \$16 @ \$16.50 for No. 2, and \$14 @ \$14.50 for Gray Forge. Southern Irons sell at \$16 @ \$17 for No. 1; \$15.25 @ \$16 for No. 2; \$15.50 @ \$16 for No. 1 Soft, and \$14 @ \$14.50 for Gray Forge.

Ferromanganese. The foreign combination has advanced the price of Ferromanganese and importers now quote \$64.50 @ \$65. Consumers, however, seem well supplied, efforts to place Ferro at the old price in anticipation of the advance not having led to much business.

Billets and Rods.—In the East the market is very dull. The feeling is easier as the result of the reports from the West, where Wire Billets are reported to have been sold at \$24.50 @ \$24.75, while Rods have changed hands at \$33.50 @ \$34. Here we quote foreign Billets \$31.25 @ \$31.50, and domestic Wire Rods \$37.50 @ \$38, tidewater.

Steel Rails.—After many weeks of dullness we can now record the placing of one good order, for about 10,000 tons, for a Southern railroad, by the Maryland Steel Company. The feeling in the trade is hopeful, and the appearance of some inquiries for round lots after so long a period of stagnation is regarded as an earnest of the better times to come. As yet there is no serious thought of higher prices, but it is believed that before long the representatives of the mills will come together and deal with a few matters of detail which need adjustment. We continue to quote \$30.75 @ \$31 at tidewater.

Manufactured Iron and Steel.—Conditions are practically unchanged. There is a fair amount of architectural work at low prices, very active competition for bridge work, and continued weakness in Plates. Bars, however, show a somewhat stronger feeling, and a moderate advance is among the possibilities of the near future. We continue to quote: Angles, 1.90¢ @ 2.10¢; Sheared Plates, 1.95¢ @ 2.25¢; Tees, 2.45¢ @ 2.75¢, and Beams and Channels, 3.1¢, on dock. Steel Plates are 1.95¢ @ 2.15¢ for Tank; 2.25¢ @ 2.6¢ for Shell; 2.4¢ @ 2.6¢ for Flange, and 3¢ @ 3.25¢ for Fire Box, on dock. Bars are 1.7¢ @ 1.9¢, on dock. Scrap Axles are quotable at 2.15¢ @ 2.20¢, delivered.

Warrant Stocks.—The American Pig-Iron Storage Warrant Company report as follows:

	Tons.
Stock in yard, August 1, 1891.....	46,400
Put in yard for 31 days ending August 31, 1891.....	1,800
Total.....	48,200

Withdrawn 31 days ending August 31, 1891.....	3,600
Net stock in yard, August 31, 1891.....	44,600
Put in September 1, 1891.....	800
Stock, September 1, 1891.....	45,400

Financial.

Indications bearing on the commercial situation were decidedly more favorable, as reflected in the buoyancy on the Stock Exchange and the increasing importance of the grain movement. But perhaps the most noteworthy feature is the marked reduction in the rate of sterling exchange, in consequence of the foreign buying of American securities and increased offering of bills against exports of wheat and cotton. Imports of gold and exports of produce had a meaning which could not be mistaken. Again, unwonted activity in the bond market afforded reasonable hope that railroad companies would soon be enabled to realize funds needed for the purchase of steel rails and making betterments that have been too long postponed. That the crop movement is acquiring large proportions appears from the shipment during the week of about \$2,750,000 by New York banks to points in the interior. Furthermore, Eastern shipments of freight from Chicago comprised the enormous amount of 170,000 tons by lake and rail together. The foreign commerce of New York during July was large, both in imports and exports, and shows nearly \$2,000,000 gain in the favorable balance of trade if specie movements are included. The exports, including specie, exceed the imports, while for the corresponding month of last year, owing to the hurrying forward of goods likely to be affected by the new tariff, the imports exceeded the exports by nearly \$11,000,000. In merchandise alone New York handled within a fraction of 50 % of the entire foreign trade of the country, and thus far in August exports from New York have increased nearly 14 %, while imports have decreased 18 %. Shipments of actual wheat from the Atlantic Seaboard for the week, including flour, were equivalent to 7,000,000 bushels.

On the Stock Exchange business expanded 25 % on the record for the previous week, and the improvement is still more striking compared with early in the month. Chesapeake and Ohio advanced on a report that the company had either obtained control of or had made an important traffic arrangement with the Ohio and Mississippi. On Friday speculation was favorably influenced by a reduction in the rates for sterling, reflecting liberal offerings of bills, and there was a sharp advance all through the list, induced by the report of the shipment of \$1,000,000 gold from Europe for New York, and also to further news from the West to the effect that the cold wave had not seriously affected the corn belt. On Saturday the appearance of the weekly bank statement was followed by a sharp advance in Rock Island, Chicago, Burlington and Quincy, Atchison, Topeka and Santa Fé and Lake Shore, and the market closed very strong, and at or about the highest prices of the week for the leaders. On Monday the buoyant feeling became more apparent when it became known that \$1,000,000 in gold had been ordered from Europe, and that more would soon follow. A report that the Vanderbilts had secured control of the Union Pacific was denied. There was a better demand for some of the cheap bonds as well as the high-class investments issues.

United States 4½s were strong at an advance. Quotations as follows:

U. S. 4½s, 1891, registered.....	101½
U. S. 4½s, 1891, coupon.....	101½
U. S. 4s, 1907, registered.....	117
U. S. 4s, 1907, coupon.....	118
U. S. currency 6s.....	100

The bank return for the week shows a decrease of \$1,341,975 in reserve, which now stands at \$12,767,825 surplus. The loans show a gain this week of \$1,891,800. The specie is down \$2,888,100. The loss in lawful money is practically a transfer to the Sub-Treasury, serving to strengthen the gold reserve. A movement was started to have the national banks of this city absorb at least \$5,000,000 of the 4½ % bonds which fell due September 1 at the extension rate of 2 %, but it failed to materialize.

The posted rates for bankers' sterling are \$4.83½ @ \$4.86 for sight. The market is heavy for Continental and steady at the decline for sterling.

Time loans were in better demand, but the offerings of short date contracts came chiefly from the foreign bankers. Rates were 4 % for 30 days, 5 % to 5½ % for 90 days and 6 % for four to six months. Commercial paper was almost stagnant. A circular from the Treasury Department extends for an indefinite period the privilege of continuing the 4½ per cent. bonds at 2 %. So far, \$2,500,000 have been received for redemption, and it is expected that the rest of the outstanding continued bonds, estimated to aggregate \$20,000,000, will be presented for redemption during the next two months. The debt statement shows that there are now \$32,471,408 of free gold in the Treasury, a gain of \$11,358,384 since August 1. The clearings of 60 cities for the week ended August 29 showed a decrease of 8.1 %. Outside of New York the decrease was 1.4 %.

In the wheat market on Tuesday there was a radical decline in prices equal to 3¢ a bushel. Heavy shipments from the West are being pushed forward as promptly as possible. At the same time all the foreign news is weak. In breadstuffs there are free sellers on account of the reaction. North Dakota's estimated yield is 50,000,000 bushels. Coffee is lower and dull. Cotton is active and advanced at the close. Provisions advanced and closed firm. Sugar is steady. Tobacco generally quiet, but prices well sustained. India rubber unsettled since the sharp break a week ago.

Exports of merchandise from this port for the week, \$8,609,000; total since January 1, \$239,000,000; increase compared with 1890, \$18,771,000. Imports for the week, \$8,762,000; total since January 1, \$359,619,000; decrease, \$1,500,000.

Canadian imports for July were \$9,807,000; exports, \$10,416,000. Duties collected decreased, principally owing to the abolition of sugar duties.

Coal Market.

The Anthracite Coal market is considerably firmer than it was a few days ago. The genuine restriction of Coal production in August and the decision of the company presidents to limit the output for September to 3,000,000 tons, the same as in August, has had the intended effect of making the desirable sizes scarce. The new schedule took effect 1st inst., as follows: Lehigh, f.o.b., Egg, \$1.15; Stove, \$4.25; Chestnut, \$3.90. Free Burning is the same, excepting Egg, which is \$4. For the last few days Coal has been selling at the July circular prices, the same as for August. Operators will endeavor to hold to September prices after the 15th, with what success remains to be seen. Production for the week ended August 22 was 713,000 tons, a slight increase compared with the corresponding week last year. Since January 1 the aggregate is 23,994,000 tons, an increase of 2,850,000 tons.

The Reading Company report their coal shipment for the week ending August 29 215,000 tons, of which 32,000 tons went to Port Richmond and 16,000 tons to New

York waters. The Philadelphia Press says: "There is a great deal of talk about an arbitrary and immediate increase in the Coal tonnage of the Reading Company. The facts seem to be that there are some \$105,000,000 of Reading securities on which nothing was earned last year, and the holders of these securities will insist on bigger tonnage and bigger earnings. It will naturally be difficult to bring the holders of the securities of other Anthracite companies to such a forbearing frame of mind that they will concede the necessary tonnage to the Reading." The foregoing hints at the one possible source of disturbance in the near future.

The Bituminous trade is governed very nearly by the prices of the Seaboard Association—viz., George's Creek, Cumberland, at Baltimore, \$2.50, f.o.b.; Philadelphia, \$2.60; South Amboy, \$3.07½; New York, alongside, \$3.25.

Vessel freights are depressed to the lowest rate, owing to the abundance of idle tonnage.

Metal Market.

Pig Tin.—Statistics of movement of supplies from primary points last month and of stocks on hand at the chief distributing centers make what would ordinarily be termed a "bearish" exhibit, the data relating to the United States being particularly so. The speculative maneuvering has been suggestive of an attempt to hold prices up in the face of the statistical position and almost complete absence of outside speculative interest. It is understood, however, that some local jobbers have purchased in a fairly liberal manner, and that considerable Tin has been sold to the out of town trade. This probably served to support values in some degree, operating as it has to check forced sales on the open market. In any event prices went but 5 to 10 points lower than they were a week ago, although spot stocks have increased to 1900 tons, and the quantity afloat for this country to 2700 tons. Wednesday's market was somewhat firmer under the influence of 5/ advance in London. Spot and current month delivery, in 10-ton lots, moved up to 20 10¢, net cash, and that rate was bid for October and 20½¢ asked. The statistical position in detail, as posted on the Metal Exchange, is as follows:

Movement.			
	1891.	1890.	1889.
Shipments in August.	Tons.	Tons.	Tons.
Straits to Great Britain.	1,800	65	1,300
Straits to America.	1,050	975	575
Straits to Continent.	700	400	...
Australia to Great Britain.	325	375	800
Australia to America.	100	50	100
Totals.	3,975	2,475	2,775
Deliveries in London.	2,110	1,810	1,410
Deliveries in Holland.	880	880	800
Shipments, Europe to America.	880	500	260
Supply.			
	Aug. 1, 1891.	Sept. 1, 1891.	Sept. 1, 1890.
Foreign in London.	3,442	2,754	3,553
Second hands in Holland.	1,790	890	1,990
On spot, America.	1,300	1,900	1,200
Totals.	6,532	5,544	6,743
Afloat for London.	2,280	2,900	1,684
Afloat for Holland.	1,380	1,840	1,620
Afloat for America.	2,100	2,700	1,850
Totals.	5,660	7,440	5,154
Total visible supply.	12,192	12,984	11,897

Copper.—The market for Ingot has been fairly firm, and, while no information of anything more than a routine business is imparted, it would appear that the current distribution, along with the firm attitude of the leading producers, has sufficient force to keep values from moving on the downward course. On Lake Ingot 12½¢ seems to be a strictly inside rate and that, to all accounts, is made only on small spot parcels. Sales were said to have been

made at 12½¢ @ 12½¢ for forward delivery. In casting brands there has been a very fair movement at 11½¢ @ 11½¢, but holders are now asking 11½¢ and offer reservedly.

Pig Lead.—Business has not been as extensive the past week as during the preceding one, but the market has gained something in point of firmness, the outcome chiefly of very reserved offering by smelters, who seem to be calculating upon a lively demand from consumers during September and October. At the moment consumers manifest no anxiety, however, and evidence is wanting of speculative interest in any quarter. The movement of single carload lots has, however, been sufficient to bring the price back to 4½¢ on actual sale, and bids of 4.47½¢ for larger quantities were refused. At this writing holders, as a rule, are asking 4.52½¢ upward. During the past few days 4½¢ was secured for about 300 tons.

Spelter.—Increase in the Western output and more pressure to make sales by some Smelters has served to additionally weaken the market, and values are unsettled at the present time. Good brands went in carload lots at 4.90¢ @ 4.92½¢ on the spot, at the same time that 4.90¢ was quoted from East St. Louis, and several parcels were previously sold in the West at the basis of 4.90¢ here. Sellers are now inclined to ask 4.95¢, spot, but buyers at that price are few and far between.

Antimony.—Prices have varied in a slight degree only and purchases are of routine character. Hallett's is quoted at 10½¢ @ 10½¢, LX at 10½¢ @ 11¢, Portuguese at 11½¢ and Cookson's at 12½¢ @ 12½¢ on the spot.

Tin Plate.—Between local dealers there has been a very fair trade. This was chiefly in the way of securing certain varieties of Plates that might be obtained on spot at less than present import cost, and which would come in handy to replenish broken assortment. Otherwise the movement continues rather slow, and large consumers manifest indifferent interest. Maryland canners, it is reported, have resold a good many cans during the past two weeks, some of which were purchased on speculation. We quote: Coke Tins—Penlan grade, IC, 14 x 20, \$5.45; J. B. grade, do., \$5.55; Bessemer do., \$5.50; Siemens Steel, \$5.60; Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.75; Siemens Steel, IC basis, \$5.85 @ \$6; IX basis, \$6.85 @ \$7. IC Charcoals—Melyn grade, \$6.50; for each additional X add \$1.50; Allaway grade, \$5.90; Grange grade, \$6; for each additional X add \$1. Charcoal Ternes—Worcester, 14 x 20, \$5.75; do., 20 x 28, \$11.25; M. F., 14 x 20, \$7.50; do., 20 x 28, \$15.50; Dean, 14 x 20, \$5.25; do., 20 x 28, \$10.50; D. R. D. grade, 14 x 20, \$5.15; do., 20 x 28, \$10; Mansel, 14 x 20, \$5.25; do., 20 x 28, \$10.25; Alyn, 14 x 20, \$5.25; do., 20 x 28, \$10.25; Dyffryn, 14 x 20, scarce; do., 20 x 28, \$11. Wasters—S. T. P. grade, 14 x 20, \$4.90; do., 20 x 28, \$9.70; Abercarne grade, 14 x 20, \$4.90; do., 20 x 28, \$9.60.

New York Metal Exchange.

The following sales are reported :

FRIDAY, August 28.	
40 tons Tin, August.	20.10¢
10 tons Tin, August.	20.05¢
(Seller's right to double.)	
25 tons Tin, September.	20.15¢
25 tons Tin, September.	20.10¢
10 tons Tin, October.	20.15¢
25 tons Tin, October.	20.11¢
(Seller's right to double.)	
MONDAY, August 31.	
25 tons Tin, November.	20.05¢
(Seller's right to double.)	
10 tons Tin, November.	20.15¢
10 tons Tin, spot.	20.00¢
10 tons Tin, October.	20.10¢

THURSDAY, September 1.

20 tons Tin, September.	20.00¢
25 tons Tin, cash, to-day.	20.00¢

WEDNESDAY, September 2.

10 tons Tin, spot.	20.05¢
10 tons Tin, spot.	20.15¢
(Buyer's option, one day's notice.)	
40 tons Tin, delivery on or after September 21.	20.10¢

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, September 2, 1891.

The Pig-Iron warrant market has remained very quiet and stocks in Connal's stores remain almost stationary. Last returns show 501,000 tons Scotch and 154,000 tons Cleveland. Firms not connected with the "ring" remain idle and are likely to continue so, as those most deeply interested in Scotch seem disinclined to let the price fall below 47/. The shipping demand is limited. Cleveland makers are firm and assert that Foundry Iron is scarce. Latest sales of warrants were at 47/ for Scotch, 30/7½ for Cleveland and 47/9 @ 48/ for Hematite.

Pig Tin, prompt delivery, advanced to £92. 2/6 on Friday under the influence of freer demand, but subsequent falling off in orders led to a reaction of 17/8 that gave the market a weak appearance. Australian Tin is still very scarce and now commands 25/ premium over Straits.

Copper has been irregular, with the average of prices somewhat lower, and Merchant-Bar prompts down to £52. 5/ on Tuesday. Consumers seem more inclined to buy but take hold very cautiously.

Tin Plates are steady. There is more inquiry from home buyers for prompt deliveries but futures are slow, as prices offered are not meeting buyers' views.

Scotch Pig Iron.—Makers' Iron is still slow of sale, and prices are barely steady.

No. 1 Coltness, f.o.b. Glasgow.	58/6
No. 1 Summerlee, " "	57/6
No. 1 Gartsherrie, " "	57/6
No. 1 Langloan, " "	58/6
No. 1 Carnbroe, " "	48/
No. 1 Shotts, " at Leith.	59/6
No. 1 Glengarnock, " Ardrossan.	57/6
No. 1 Dalmeilington, " "	50/
No. 1 Eglinton, " "	49/6
Steamer freights, Glasgow to New York, 2/	
Liverpool to New York, 10/.	

Cleveland Pig.—There has been a very fair business, and the market is steady at 39/6 for No. 3 Middlesborough, f.o.b.

Bessemer Pig.—No improvement in the demand and prices rather weak at 49/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Spiegeleisen.—The market remains quiet and unchanged. English 20% quoted at 95/, f.o.b. shipping port.

Steel Rails.—Demand continues slow, and makers ask former prices. Heavy sections quoted £4. 5/, and light sections £4. 15/ @ £5. 5/, f.o.b. at N. W. England shipping point.

Steel Blooms.—Market very quiet; prices rather weak. Makers quote £4. 5/ for 7' x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—Sales are still light, and the demand is no better. Bessemer,

2½ x 2½ inches, quoted at £4. 7/6, f.o.b. at N. W. England shipping point

Steel Slabs.—Business slow, and prices without change. Bessemer quoted at £4. 7/6, f.o.b. at N. W. England shipping point.

Old Iron Rails.—No change in these. Inquiries are few and for small lots. Tees quoted at £3. 17/6 @ £3 and Double Heads £3 @ £3. 2/6, f.o.b.

Scrap Iron.—The market steady but very quiet. Heavy Wrought Iron quoted at £2. 10/ @ £2. 12/6, f.o.b.

Crop Ends.—Very little movement and no increase in demand. Bessemer quoted at £2. 12/6 @ £2. 15/, f.o.b.

Tin Plate.—The condition of the market is wholly unchanged. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade.....	14/9 @ 15/6
IC Bessemer Steel, Coke finish.....	13/6 @ 13/9
IC Siemens.....	13/9 @ 14/
IC Coke, B. V. grade.....	13/ @ 13/3
Charcoal Terne, Dean grade.....	13/ @ 13/3

Manufactured Iron.—No improvement noted in the demand for any line of goods. We quote, f.o.b. Liverpool:

Staff, Marked Bars.....	£ s. d.	£ s. d.
Common.....	6 10 0 @	6 12 0
Staff, B'k Sheet, singles.....	6 7 0 @	7 0 0
Weish Bars (f.o.b. Wales).....	5 10 0 @	5 12 0

Pig Tin.—The market somewhat unsettled at the close. Straits quoted at £91. 7/6 @ £91. 10/, spot, and £91. 12/6 @ £91. 15/ for three months' futures.

Copper.—Business moderate at the close but prices steady. Merchant Bars quoted at £52. 5/, spot, and £52. 15/, three months' futures. Best Selected, £56. 10/.

Lead.—Market has continued dull and prices are unchanged. We quote at £12 for Soft Spanish.

Spelter.—There has been more doing and the market is firmer, at £23. 10/ for ordinary Silesian.

Imports.

Hardware, Machinery, &c.

Best, J. P. & Co., Gun Barrels, cs., 13
Baker, Hermann & Co., cs., 24
Botany Worsted Mills, Mach'y, cs., 110
Deely, Robert, Mach'y, cs., 4
Devoy Bros., Mach'y, cs., 32
Field, Alfred & Co., Arms, cs., 71
Falk, J. E., Mach'y, cs., 3
Folsom, H. & D. Arms Co., Arms, cs., 27
Goodyear's India-Rubber Glove Company, Mach'y, cs., 3
Hammacher, S. & Co., Nails, cs., 32
Hartley & Graham, Arms, cs., 4
Henderson Bros., Arms, 288
Honduras Line, Mach'y, pgs., 14
Jordan, A. J., Arms, cs., 3
Lau, J. H. & Co., Arms, cs., 13
Mecham Arms Company, Guns, cs., 22
Pim, Forwood & Co., Mach'y, cs., 19
Rouse, C. B., Arms, cs., 5
Saville, H. L., Mach'y, pgs., 5
Sanderson & Sons, Cast-Iron Shields, 5
Sheldon, G. W. & Co., Arms, cs., 5
Schoverling, D. & G., Arms, cs., 46
Sellers, W. B., Mdse., cs., 3
Ward, Jas. E., Mach'y, cs., 55
Werleemann, H., Guns, cs., 48
Wiebusch & Hilger, Guns, cs., 6
Wyman, Chas. H. & Co., Arms, cs., 18
Order—Mach'y, pgs., 33

We are advised by telegraph that the offerings of Pig Lead in the St. Louis Market are limited, and for September delivery 4.25¢ is quoted. A sale of 150 tons was made yesterday for immediate shipment at 4.25¢. Stocks both in consumers' and producers' hands are light, and the prospect for higher prices in the near future is considered encouraging. Spelter continues in the same listless condition. Offerings are made on the basis of 4.65¢ for delivery, extending throughout the

year, but if one wanted Spelter very badly it is quite likely this price could be shaded.

NEW PUBLICATIONS.

MANGANESE, ITS USES, ORES AND DEPOSITS; by Dr. R. A. F. Penrose, Jr.; Vol. 1, Annual Report of the Geological Survey of Arkansas, 1890; Dr. John C. Branner, State Geologist, Little Rock, Ark.

A flood of light has been thrown on the Arkansas manganese deposits by the large volume recently published by the Arkansas Geological Survey. Dr. Penrose has thoroughly qualified himself to carry out this important work by making an exhaustive and detailed study not alone of the manganese deposits of the State but also of the principal mines in other sections of the country, which he has visited, largely at his own expense. The first part of the volume deals with the uses and the ores of manganese, the greater part of these chapters being, of course, compilations from the literature on the subject, supplemented by an apparently extensive correspondence with some of the leading authorities. The second and greater part of the work proper contains the records of the examination of the deposits of Arkansas, which are grouped in two districts, that of the Batesville region and that of the southwestern part of the State. The former has been exclusively the source of the shipments of ore from the State. We printed last week Dr. Penrose's summary of the history and geology of this section, of which so much was expected at one time and which, at least to some of those interested, proved partially disappointing. The second section, that of southwestern Arkansas, has been proved by the Survey to be particularly valueless as a source of manganese ore. Dr. Penrose goes into details on the points relating to the history, the genesis, the geology and the industrial features of the two districts, and completes his volume by a survey of the deposits of the Appalachian region of Texas, the Rocky Mountains, California and Canada.

ANNUAL REPORT OF THE STATE GEOLOGIST OF NEW JERSEY FOR THE YEAR 1890.

John C. Smock, the successor of the late Dr. Cook, has just issued his annual report, which deals chiefly with the water power and water supply of the State, its artesian wells and its drainage. Those sections of it which are likely to be most interesting to persons identified with the iron trade are the notes on the active iron mines by Frank L. Nason, a piece of work which in some respects does not come up to the standard. A very useful part of the volume is the list of iron mines, with reference to the publication of data in the different parts of the survey. Two very handsome maps accompany the volume, one of them showing the location of the principal iron mines in 1890, and the other being a map of the State indicating its water sheds.

WIRE: ITS MANUFACTURE AND USES. By J. Bucknall Smith, C. E. Published by Engineering, London, and John Wiley & Sons, New York.

J. Bucknall Smith, who many in the wire trade of this country will remember as a visitor some time since, is the author of a work on wire which records the results of long experience and varied observations in many countries. The volume differs, therefore, in this respect from the majority of insular publications in that it recognizes the existence of an industry in this country and on the Continent. Mr. Smith's work is not a technical treatise in the narrower sense. Many of his chapters

approach the popular treatment, and the volume throughout reveals the writer who has learned to look at questions from a commercial point of view. That Mr. Smith is not a rolling mill man is quite clearly shown by his brief summary of this branch of work, which in some respects justly glories in having achieved marvelous progress during the past decade. Nor is his treatment of wire drawing as elaborate as might be expected, but he does print some very interesting matter on wire rope and wire rope machinery, wire rope tramways, wire netting machinery, wire weaving and miscellaneous applications of wire. The work throughout is well written and quite free from mistakes. We are skeptical, however, when we are told that "some of the European factories of wire nails turn out over a quarter of a million tons per annum" (page 19). The volume is well printed and well equipped with fine illustrations.

Jos. Riddle and J. G. Morrison, residents of Sharon, Pa., have received letters patent on a gas burner for use under blast furnace boilers and hot blast, in which they claim a great saving of gas under the old way of burning it under boilers and also a largely increased efficiency. A number of the gas burners are in practical use, and the claim is made that in every case much better results are obtained on less than half the gas that was formerly used. Two of them have been used since November of last year on a battery of boilers at the blast-furnace plant of the Sharon Iron Company, Limited, at Sharon, Pa. The construction of the burner is very simple, and it is claimed that it can be attached to almost any boiler or hot blast.

The *Labor Tribune* announces that at the recent convention of the A. A. of I. and S. W. a resolution was passed to furnish all union wire nail mills with a trademark, the same to be patented and furnished to all mills working under the A. A. of I. and S. W. As soon as they can get it in shape to use the mills will receive it. It will be in the shape of a sticker and put on the head of each keg.

"Dials" is the title of a neat little pamphlet sent out by the Thomson Meter Company of this city which contains the replies from water-works engineers to questions bearing on the relative merits of the usual and a new design of dial for water meters.

The Coltness Iron Company of Scotland have replaced the cast-iron stoves of their 12 blast furnaces with 70-foot Ford & Moncur brick stoves.

It is reported that the Essex Iron Company, recently incorporated, are to operate the Cheever Mine, near Port Henry, N. Y., and build a separator.

H. L. Bridgman, superintendent of the Chicago Copper Refining Company of Blue Island, Ill., has designed a very ingenious ore sampling machine.

H. C. Orr, general Southwestern Passenger Agent of the Burlington system, Kansas City, Mo., has invented a system for cooling passenger cars during warm weather. By his system it is claimed that the temperature of coaches can be reduced to almost freezing on the hottest day.

The statement that the Troy Steel and Iron Company are supplying projectiles for the Ordnance Department of the British Government is pronounced untrue by the officers of the company.

HARDWARE.

Condition of Trade.

REPORTS CONTINUE favorable regarding both the trade actually doing and the prospects, without, however, any indications of advancing prices. Travelers are sending in good orders and report a very cheerful feeling among their customers.

Chicago.

(By Telegraph.)

The demand for Shelf Hardware increases every day. The character of the trade, however, has not changed, continuing to run mainly to Shelf goods and seasonable articles, with only a fair sprinkling of staple goods. The manner in which country merchants are buying is taken as an indication that there will be a strong demand for general Hardware as soon as the farmers begin to receive the money for their crops. Orders are almost invariably to sort up and only cover what must be laid in. Those who usually take carload lots of staple goods are buying only small quantities and will, therefore, have light stocks when the demand comes which is now believed to be inevitable. Tin Plate is steady. Sheet Copper is demoralized and shows no signs of stiffening. Sheet Brass has improved a little, the low price having stimulated the demand, but rates have not advanced. Heavy Hardware maintains its pace, every day showing a steady gain on the corresponding day of last year.

St. Louis.

(By Telegraph.)

The Hardware trade continues to improve. The demand for Shelf Hardware is very large. The demoralization in Sheet Copper continues, and it is impossible to say when bottom will be reached. The exposition, which opens here this week, will bring many buyers to this market, and a large trade is expected during the next six weeks, which is the time the exposition will remain open. The Southern trade is somewhat better, but does not meet the expectations of jobbers, while, as stated last week, trade in the West and Northwest is unusually heavy. There is a good demand for Window Glass, and the same can be said of Paints. There appears to be no falling off in the demand for Tin Plates, but prices are considerably mixed. The situation, as a whole, is fairly satisfactory, and each week's trade shows a substantial increase over last year.

Louisville.

W. B. BELKNAP & Co.—It is pleasant to report a continued good demand for Iron and Iron products generally. This demand is based not on anything speculative for there are no indications of rapid advance in price, but arises from the fact that the country has been buying in a small way for so long that we are down

on a basis of consumption. What is being sold is for the country's wants from day to day. The railroads are busy with their seasonable freight, and already complaints of scarcity of freight cars are being heard, notwithstanding the fact that the Car Service Association is doing much to keep the rolling stock in motion, whereby a car is made to do almost twice the duty it did formerly, when it might be used as a warehouse on side tracks; and in face of the fact, too, that copious rains have kept the watercourses full, so that navigation is free, and has been so uninterruptedly all summer. It makes a vast difference in the Ohio Valley whether the heavy freights can get out of Pittsburgh, Wheeling and that district by water, to say nothing of farm products, grain, &c., on the smaller streams in the interior. The railroads have had no such stimulus as a drought gives for the past two or three years, and still their business has been constantly on the increase. The financial outlook, too, is much better. Banks which have been hoarding their resources to run extra strong, unnecessarily so in times of safety, are now beginning to put out their lines with more freedom, carefully guarding their credits, however. Altogether, the prospect is full of encouragement, though we do not expect to see the full benefits from the fine crops felt to their full extent until next year.

Baltimore.

CARLIN & FULTON.—The rapidity with which the weeks pass makes it difficult for us to observe any great contrasts in the conditions of trade between the dates of our successive reports; nevertheless, we can see since our last letter a continued improvement as we draw nearer to the fall season. While the immense crops throughout this entire country have generally given great satisfaction to the farmer, it is a matter of great regret that the cotton planter in the South is compelled to see the great staple of his section, and, in fact, his entire dependence, selling at a figure which is below the cost of its production, with no hope for any speedy improvement in its price. This is discouraging, but we are glad to say that it is fortunate for the trade that this depression in price has happened before the season begun, thereby causing closer collections, careful buying and conservative actions generally. We also notice rather a reaction from the speculative fever in booming real estate, which is very encouraging, as it will allow a natural development of the towns having advantages rather than a forced growth through speculation. It is too early yet for the manufacturing interests of the country to feel the beneficial results of this year's harvests in a demand for goods sufficiently great to advance prices to the point of satisfaction, but it seems that this result is bound to happen in the not distant future; and where prices

are not sustained nor advanced by the natural laws of supply and demand, the desired end is being gradually accomplished by means of the trust, the combination and the pool.

Cleveland.

THE W. BINGHAM COMPANY.—The long dry spell which we have been experiencing through July and the early part of August has been relieved by copious rains, which have brightened things up very much. Orders from travelers are coming in freely, and for good assortments of shelf goods. Season goods, such as Elbows, Coal Hods, Stove Boards and Sheet Iron, are in good demand and prices well maintained. Staples are dull, with possibly the exception of Wire Nails, which seem to be going freely on a rather weak market at \$2.10 from stock. In Cut Nails there is little or nothing doing at \$1.65 from stock. City retailers report trade as fair.

Boston.

BIGELOW & DOWSE.—There is now a decided improvement in the volume of business. The improvement comes earlier than is usual this fall. A notice of an advance in freight rates September 1 has acted as an incentive to place early orders for Wire and Cut Nails, so they could be shipped at the lower rates ruling previous to September 1. These orders have been quite large. Steel Cut Nails have displaced the old Scrap Iron Nails almost entirely. It is understood the Steel Nails cost less to make and are far better than the Iron. The sale of Wire Nails now about equals the sale of Cut Nails. In view of the fact that New England but a few years ago manufactured a large portion of all the Cut Nails used in the whole country, it may be an interesting fact to know that it now obtains almost its whole supply from the West. It is understood that the employees of the various Axe and Tool factories owned by the American Axe and Tool Company are on a strike. If this continues it will materially interfere with the supply and cause a scarcity later on. Prices on Axes were never any lower than they are this year, and it would seem to be safe and good judgment to place early orders. General Hardware orders are well assorted and cover the general line. Everything indicates a good trade this fall.

San Francisco.

HUNTINGTON-HOPKINS COMPANY.—We note no material change from our last report any more than possibly a slight falling off in general trade. Shelf Hardware is not in very great demand, and the call for staples is also somewhat diminished. We are forced to note quite a shrinkage in demand for Nails, both Cut and Wire. This fact, in the face of the large stocks carried at present, does not indicate a satisfactory condition. We are

not at all surprised at the diminution of trade, as we find that it is general throughout the entire country. This fact we arrive at from examination of clearing-house statistics. Collections still fairly good.

Portland, Ore.

FOSTER & ROBERTSON.—The last two weeks have been quiet and uneventful. Farmers are working early and late gathering the bountiful harvest with which every portion of our territory is blessed this year. An active demand for everything that the farmer has to sell, coupled with good prices, will have a decidedly stimulating effect on fall trade, unless, as may possibly be the case, the farmers decide to hold for still higher figures, which will doubtless result in the failure on their part to meet their last year's obligations and the withdrawal of further credit on the part of the merchants. The volume of business continues good—fully equal to previous years—and it would doubtless be much larger were jobbers inclined to extend credits as freely as heretofore.

Philadelphia.

SUTLEE HARDWARE COMPANY.—Trade continues (during the past two weeks) without much change, although it lacks the rush that we have in some years experienced from the Southeastern section of the country. That being the cotton growing country, that is not so much to be wondered at, as all parties are holding off placing their orders until money has been realized upon the present crop. Where same is ready for the market it is being held on account of the low price the crop is bringing this year. In other sections trade seems to be picking up, and from crop prospects it looks as if it would be above the average in many sections. We have had plenty of rain in Pennsylvania, but it has been too late to do any damage to the crops. The only thing affected to any account has been potatoes, which have been damaged considerably. The reports, however, on tobacco have been exceedingly encouraging, the quality having been reported as the finest that has ever been grown in the State. The prices on a few articles, such as Screws and Hinges, have been a little weakened, but there has been a corresponding stiffening on a few other articles. Barb Wire has started to sell freely at the advanced price, considering the season of the year. Meat Cutters have had a very good call, and Cutlery is commencing to be in some demand, although the trade still purchases conservatively. The bank reserves are still good, but they are holding their money rather tighter than they were the same season last year, although to regular customers and on good securities the usual amounts can be borrowed. Collections, while not exceedingly good, cannot claim to be bad.

JOHN SHADBOLT, president of the Shadbolt & Boyd Iron Company of Milwaukee, Wis., and very prominently identified with the Hardware trade of the Northwest for many years, died on August 23, aged 74 years.

Notes on Prices.

Barb Wire.—A fair amount of business is being done, both by manufacturers and jobbers. There is no deviation from the prices established by the Columbia Patent Company, which, with their freight allowances, will be found in our Prices Current.

Chicago, by Telegraph.—A fair demand is noted, which is perhaps fully up to the average for the season, inasmuch as farmers have not had much time for making fences recently. A very heavy demand is expected to follow the gathering of this year's crops, as an increased acreage is sure to be inclosed and cultivated next year, which means the use of more Fence Wire. Jobbers quote the same price as the Columbia Patent Company—viz., \$2.85 for Painted and \$3.35 for Galvanized, in small lots, with 5 cents off for carloads. There is a growing disposition to regard the Columbia Patent Company with favor, as it is seen that with the trade under thorough control prices will be steady and purchases can be made with confidence. The policy of the company in making no advance to fall heavily on the consumer is commended.

Wire Nails.—The demand has been active and many large sales have been made, but prices have not improved, and many mills are now offering at \$1.85, at mill. We quote \$1.85 to \$1.95, for carload lots at mill, and \$2 to 2.10, for small lots from store.

Chicago, by Telegraph.—Business is fairly active, but not so heavy as the last two weeks, when orders were perhaps stimulated by the expected advance in freight rates, as well as the low prices. Some large inquiries for heavier lots are still in the market. Most manufacturers quote \$2.05, Chicago, for factory lots, but it is understood that one or two makers are anxious for business, and this causes prices to be somewhat unsettled. Jobbers quote \$2.10 to \$2.15, from stock.

We have received the following letter from J. W. Gates, general manager of the Columbia Patent Company:

CHICAGO, Ill., August 29, 1891.

To the Editor of The Iron Age.—My attention has been called to the following telegram, under the head of "Wire Nails, Chicago, by Telegraph:"

"The demoralization is ascribed to manufacturers of Barbed Wire who also make Wire Nails. The sales of Barbed Wire are not up to the usual volume, and as that outlet is guarded by the new selling arrangement, their surplus Plain Wire is being turned into Wire Nails, with this result."

In answer to that, as one of the above parties alluded to, being makers of Barbed Wire and Wire Nails, I wish to plead "not guilty," and state to you that I know positively that this is not the case—that the makers of Barbed Wire who are also the makers of Wire Nails are from 5 to 15 cents per keg more than the makers of Wire Nails exclusively. The present demoralization of the Wire Nail business nor any part of it is attributable either directly or indirectly to the Barbed Fence Wire makers who are also makers of Wire Nails, but comes from the makers who are Wire Nail makers exclusively. Yours truly,

J. W. GATES.

Cut Nails.—There is no change to report during the week in prices, but the demand has been considerably better, and mills generally seem to be well supplied with orders. We continue our quotation of \$1.60 to \$1.65 for the Wheeling district, and \$1.50 to \$1.55 for the Eastern district, round lots at mill, with the usual 25 or 30 cent average.

Chicago, by Telegraph.—Cut Steel Nails are not as firm as they should be, considering the fact that several of the leading sellers in this market have withdrawn with all the orders they can take care of for the next month. Jobbers are also inclined to weakness, some having evidently secured cheap Nails. Manufacturers quote factory lots at \$1.70, Chicago on a 30-cent average, and jobbers quote \$1.75 to \$1.80.

Handled Hoes.—The manufacturers of Handled Field and Garden Hoes have adopted as the price for the coming season discount 70 per cent. to the retail trade. This discount applies to the list of prices lately adopted by the makers and will result in a slight advance upon the most important lines.

Glass.—The demand for Glass continues light, with no change in prices of American or French Window Glass. The Committee on Wages failed to agree at a meeting held on the 1st inst. at Pittsburgh. This will doubtless postpone the starting of the Glass factories until October 1, if not later. The manufacturers have decided not to make any concessions to the operatives, even if the factories remain shut down for an indefinite period. If some arrangement is not made for the factories resuming operations, prices on Glass will be advanced. We are assured that if there was any demand for Glass at the present time there would be an advance on present prices. French Glass is still being sold at 80 and 80 and 5 per cent. discount to close buyers. A meeting of Glass importers will be held the coming week, with the view of placing the business upon a more profitable basis. It is reported from Pittsburgh that a meeting of Plate Glass jobbers and manufacturers was held in that city last week, at which the Plate Glass Jobber Association requested the manufacturers to reduce prices on Plate Glass. The manufacturers decided to make a reduction of 5 per cent. It is understood that one of the largest Plate Glass manufacturing concerns had previously made a reduction of 12 per cent. in their price, selling exclusively to a syndicate of six jobbers. This was the cause of the request that other factories should reduce their prices. Printed quotations remain unchanged, as follows: American Window Glass, in carloads, 80 and 10 per cent. discount; less than car lots, 80 and 5 per cent. discount; French Window Glass, 75 and 10 and 5 per cent. discount, with an additional 5 per cent. discount when 50 boxes are ordered and taken in any calendar month. American Plate is held at discount 50, 10 and 5 per cent., and Imported Plate at discount 60 per cent.

C. Hammond & Son, Philadelphia, Pa., manufacturers of Hammers, Hatchets, Railroad, Machinists' and Blacksmiths' Tools, issue the following discounts, to apply to their price-list of April 1, 1891:

	Numbers.	Per cent.
Hatchets.....	10 to 127	40&10
Axes, Broad.....	130 to 140	40&10
" Boys' and Hunters'.....	150 to 161	40&10
Hammers.....	170 to 332	40&10
".....	340 to 350	40&10
".....	360 to 362	40&10
".....	370 to 420	70&10
Axes, Stone.....	430	70&10
Anvil Tools.....	440 to 520	70&10
Sledges.....	530 to 560	70&10
Hammers, Drilling.....	570 to 586	70&10
Mauls.....	590 to 610	70&10
Wedges.....	615 to 616	70&10
Picks, Mill.....	620	70&10
Hoes, Grubbing.....	630	50&10
Chisels.....	640 to 650	70&10

American Wheel Company.—The order of the court having authorized the receiver to continue the business of the American Wheel Company, the question has come up as to what would be his attitude in the matter of orders for future delivery and whether he would be authorized to make contracts and fix prices therefor. This uncertainty has been removed by an additional order of the court authorizing him to make contracts for Wheels for next season's trade.

Trade Items.

THE NEXT MEETING of the Retail Hardware and Stove Dealers' Association will be held on the evening of September 9 at the rooms of the Mechanics' and Traders' Exchange, 363 Fulton street, Brooklyn, N. Y.

THE WILCOX & HOWE COMPANY, Birmingham, Conn., manufacturers of Carriage Hardware, organized January 1, 1891, have declared a dividend of 2½ per cent. on the first six months' business. They advise us that they are preparing a very complete catalogue of Forged Irons for light buggies and surreys, which will be ready in a few weeks.

CHELSEA FILE WORKS, Norwich, Conn., advise us that they are running full time on their well-known Chelsea Hand-Cut Horse Rasps.

L. S. STARRETT, Athol, Mass., in his page advertisement in this issue, illustrates some of the Mechanical Tools which he is putting on the market. It is stated that a new catalogue, illustrating a number of Tools for machinists, carpenters and draftsmen, never before shown, will be ready in about two weeks, and will be sent on application.

A. J. PHILLIPS & Co., Fenton, Mich., advise us that they have just completed a new building to be used in connection with their factory, the object of which is to increase their manufacturing and storing capacity for Window Screens and Screen Doors. This building adds 26,000 square feet of floor space and is built in the best manner. The firm have also purchased 7 acres of land adjacent to the factory grounds for the purpose of lumber storage. They have already accumulated 100,000 feet of lumber for next season's business in the Screen line, and are adopting several new features for systematizing their work and shipments, so that customers entitled to preference on account of early orders shall be treated deservedly. Their inability to supply all their customers during the past season is referred to by the manufacturers as the reason for making the above improvements. The factory will start September 1, and it is expected that it will be run to its full capacity till the first of next August, averaging 2400

Screens per day. The firm are also preparing a good stock of Snow Shovels for the coming winter.

GOODALE & HARRY, 146 Franklin street, Boston, succeed H. D. Goodale, Philip E. Harry having been admitted as a partner in the business. The business having enlarged they were obliged to remove to larger quarters, and have secured room 3 at the above number, where they have increased facilities for doing business. They are selling agents for a large number of manufacturers, and also carry a full line of Julius Berbecker & Co.'s Gilt Nails, cabinet and upholstery Hardware.

STEEL EDGE STAMPING AND RETINING COMPANY, 89 State street, Boston, Mass., illustrate in their advertisement, which occupies a page in another part of this issue, some of the specialties which they are offering to the trade, among which are the Steel Edge Dust Pan, Intelligent Oil Can, Improved Dover Egg Beater, &c.

THE VOIGT METAL COMPANY, Reading, Pa., have opened an office and warehouse at 259 North Third street, Philadelphia. C. F. Voigt, who has had long experience in metals, has charge of the Philadelphia branch of the business.

WARREN, WEBSTER & Co. of Philadelphia, some time ago shipped two of their Vacuum Exhaust Steam Economizers to Antwerp, to be tested in competition with the best devices of the kind in Europe. The result is an order for eight additional economizers and a proposal to purchase the patents for all Europe.

THE ADVERTISEMENT of the E. J. Manville Machine Company, Waterbury, Conn., which appears on another page, represents their improved Automatic Wire Forming Machine, which is built in several sizes. Some of the shapes which are rendered possible by the use of this machine are illustrated.

ALBERT H. HILDICK, importer and Hardware commission merchant, was found dead in his office at 23 Murray street, New York City, on the morning of August 26. It was evident that he had committed suicide, and had suffered greatly before the poison had taken fatal effect. Mr. Hildick was 68 years old and lived at the Bristol, 15 East Eleventh street. He was an Englishman by birth, having come to this country when a lad, and attended school here. Early in life he entered the Hardware trade, and has been associated with some of the oldest firms in the importing branch of the business. Domestic and business troubles and a naturally despondent nature are given as the reasons for his having taken his life.

CHAMPION BLOWER AND FORGE COMPANY of Lancaster, Pa., are making preparations to still further increase their manufacturing facilities. They claim, and say they are prepared to substantiate the claim, that they have put out 38,000 Forges without being called upon for a single repair. They have also sent out 15,000 Champion Blacksmith Post Drills.

THE TRADE WILL OBSERVE the page advertisement in which Norton Emery Wheel Company, Worcester, Mass., illustrate their Worcester Drill Grinder, which is referred to as a high-grade machine at a moderate price. Their Emery and Corundum Wheels are also represented.

THE IRON BARK Selkirkshire of Glasgow, 1192 tons register, Brabender master, is now loading at Pier 9, East River, and will be dispatched for Sydney and Newcastle about the middle of September. The bark Amy Turner, 961 tons register, Captain Johnson, for Adelaide, is loading at Pier 14.

SOMMER BROS., Portsmouth, Ohio, have recently entered the Hardware business at that point. They will carry a well assorted line of General Hardware and Cutlery.

THE ARMSTRONG MFG. COMPANY, Bridgeport, Conn., and 242 Canal street, New York, manufacturers of Water, Steam and Gas Fitters' Tools, illustrate in their advertisement in this issue an assortment of these goods. A catalogue showing the company's line will be sent on application.

THE PLANT of the Allentown Hardware Company, at Allentown, Pa., has been sold at public sale to the bondholders for \$26,200. It is stated that the bondholders will organize a new company with a capital stock of \$80,000, and will put the works in operation.

WE REFERRED last week to the death of John Hillis, a driver for several of the Hardware houses of this city, who was killed in the Park place disaster, and to the fact that a subscription was being taken up in the Hardware trade for his family. We are furnished the following list of contributors:

Stanley Rule and Level Company and employees.....	\$70.75
Sargent & Co. and employees.....	66.00
Russell & Erwin Mfg. Company and employees.....	16.75
J. Russell & Co.....	20.00
Smith, Lyon & Field and employees.....	32.50
Geo. Wostenholme & Sons' Agency.....	18.00
Crane & McMahon.....	20.00
Topping & Fox.....	10.00
Underhill, Clinch & Co.....	10.00
Tower & Lyon.....	10.00
Sickels, Sweet & Lyon.....	10.00
F. S. Pilditch.....	10.00
David Williams.....	10.00
Geo. Coles.....	5.00
John Furlong.....	5.00
Peter McCartee.....	5.00
Peck, Stow & Wilcox Company.....	5.00
Wallace & Sons.....	5.00
Greene, Tweed & Co.....	5.00
Metropolitan Hardware Company.....	5.00
Union Nut Company.....	5.00
Edw. Millard.....	5.00
P. L. North & Son.....	5.00
H. S. T.....	5.00
W. J. Kingsland.....	5.00
Fred. Gurney.....	2.00
H. L. Judd.....	2.00
Jas. Vick.....	2.00
Jas. McCaughan.....	1.00
A. Field.....	1.00
Sayres Hadley.....	1.00
G. W. Whyard.....	1.00
E. Monash.....	1.00
Phillip Becker.....	1.00
John Byrne.....	1.00
W. C. Connell.....	1.00
Sam'l Livingston.....	1.00
Friend.....	1.00
A. Toblman.....	1.00

\$381.00

Price-Lists, Circulars, &c.

MERRIAM MFG. COMPANY, Durham, Conn.: Reinforced Cash Boxes and Yale Banded Cash or Document Boxes. The Reinforced Boxes, which are made in nine sizes, are reinforced all around the bottom and top edges, finished in maroon enamel, with gold bands. The Yale Banded Boxes are fitted with special Yale locks, with two corrugated keys to each lock. The Boxes are described as being of the heaviest tin plate, with all edges and corners protected by solid bands of the same material, making them practically indestructible. A small display rack is shown, filled with five leading sizes of Cash Boxes, upon which special net prices are given, for introduction.

THE IMPROVED PROCESS GLUE COMPANY, Gloucester, Mass., with New York office 95 Chambers street, in charge of Tower & Lyon: Improved Process Liquid Fish Glues and Belting Cement. These glues are put up in various sized packages, adapted to the uses for which they are intended, illustrations and price-lists being

given in a catalogue issued by the manufacturers.

DAME, STODDARD & KENDALL, 374 Washington street, Boston: Dog Collars, Muzzles, Bells, Chains, Locks, Whips, &c. An extensive and varied line of Dog Collars and Dog Goods are illustrated in connection with list prices, in a recently issued catalogue. The above firm are wholesale and retail dealers in athletic goods generally, a number of which they manufacture.

CORDLEY & HAYES, 173 and 175 Duane street, New York: Indurated Fiber Ware. Their catalogue No. 244, August 1, 1891, supersedes all previous lists. Attention is directed to reductions in prices on Indurated Fiber Ware; the following goods are mentioned as of special interest at reduced rates: Liquid or Vinegar Measures, Stable Pails, Deep Fire Pails, Railroad Pails, Butter or Bread Bowls, Dish Pans, Champagne Coolers, Knife Cleaners, Spittoons, Chamber Pails, Slop-Jar Mats, Grocers' Scoops, Pickle Tubs, &c.

MACHINISTS' SUPPLY COMPANY, Chicago, Ill.: Machinery, Tools and Supplies for metal workers' use. Their catalogue No. 3 contains 330 pages, with illustrations and price-lists of these goods. They state that their endeavor has been to present a book embracing articles of the latest and most improved character, many of which have never before been described or illustrated.

SINGER, NIMICK & Co., Pittsburgh, Pa.: Axles and Springs. The manufacturers claim for these goods that they are first class in quality and workmanship, and that they are suitable for those who require a superior class of goods. They manufacture specially their own spring steel for Springs, and the steel and iron for their Axles.

A. F. SHAPLEIGH HARDWARE COMPANY, St. Louis, Mo.: Price current of fall goods. Illustrations are given of Axes, Corn Knives, Meat Cutters, Apple Parers, Lanterns, Oil Cans, Lamps, Fire Shovels, Corn Huskers, Sleigh Bells, Hollow Ware, Plated Ware and other season goods.

PRATT & LETCHWORTH, Buffalo, N. Y., call attention to their Saddlery Hardware and complete line of staple goods on their monthly calendar card for September.

WESTCOTT CHURCH COMPANY, Oneida, N. Y., manufacturers of Westcott's Lathe Chucks and Little Giant Drill, issue catalogues of these goods in French and German. These are identical with their American catalogue, having the same illustrations, descriptions and prices.

TUCKER & DORSEY MFG. COMPANY, Indianapolis, Ind.: Alarm Tills, Saw Bucks, Stove Trucks, Vegetable Cutters, Slaw Cutters, Towel Racks, Hat and Coat Racks, Knife Trays, Bench Hooks, Saw Frames, Barrel Trucks, Casters, Factory and Warehouse Trucks, &c.

THE GOULDS MFG. COMPANY, Seneca Falls, N. Y., and 16 Murray street, New York, are about issuing catalogue of Triplex Electric Pumps and applications, also applications of Triplex Power Pumps and catalogue of the same. Illustrations are given of Triplex Electric Pumps filling supply tank, operating elevator, on both open and closed tank systems, in use in mines, &c., also Portable Electric Pump in operation. Separate cuts of Pumps are given, accompanied by descriptions with sizes, prices, &c. A number of illustrations show applications of Triplex Power Pumps for mill service. Tables of capacity, power, efficiency, &c., are given, being the results of tests of the Triplex Electric Pumps and T-H Motors conducted at Thomson-Houston Works, Lynn, Mass., under the joint supervision of competent hydraulic and electrical engineers.

RIPLEY & BRONSON, St. Louis, Mo.: Boiler makers and Engine builders, water and gas works' contractors, steam and gas fitters, mills, factories, mines, &c. Their catalogue, under date August 1,

1891, is a cloth-bound volume of over 400 pages, printed and illustrated on excellent paper, with descriptions and prices of goods. The work is designed as a book of reference, and contains tables which are intended for the use of engineers, machinists, boilermakers and others in figuring on the construction of work of various kinds.

JUSTUS ROE & SONS, New York: Roe's Steel Tape Measures, Improved Pantographs, Traverse Table Blanks, Pocket Protractors, Square, Triangle, Rule and Scale combined in one. The manufacturers state that their plain Steel Tapes are now covered with an alloy of aluminium, and then with a coat of nickel, and are not affected by any of the acids, air or salt water; also that all of their Chain Tapes on brass or wood reels now have figures at the 5 and 10 foot divisions stamped on brass or copper plates, and not etched.

THE GLOBE COMPANY, Cincinnati, Ohio and New York: Filing Cabinets for letters and documents; also office furniture. In a recent catalogue the specialties which this concern manufacture are finely illustrated, with particulars as to dimensions, capacity, prices, &c. Near the end of the catalogue several pages are devoted to Desks and Chairs. The book is artistic in its get-up, presenting a handsome appearance, copies of which will be mailed by the above company upon application.

Collapse of the Rubber Syndicate.

IT IS OFFICIALLY ANNOUNCED that John C. Goncalve Vianna, *alias* Baron de Gondoriz, the head of the Para Rubber Syndicate, has failed, and consequently the large amount of crude rubber which was held has been thrown upon the market. The Baron was manager of the syndicate, which had its headquarters at Para, with branch offices in London, Paris and New York. The cause of the failure was that the syndicate, with a capital of \$25,000,000 invested in rubber, was not able to borrow more money to buy up the new crop now coming into Para from the forests of Brazil. The amount of rubber held by the syndicate is estimated to have been between 5,000,000 and 7,000,000 pounds. As a result of this rubber being offered for sale, the price of Para has fallen from 85 to 90 cents a pound to 60 or 65 cents, the latter being considered fair value for it. A further decline in price is not unlooked for. Although the Baron had already made repeated failures in endeavoring to corner the rubber market, he was able to induce foreign capitalists to invest in the project by assuring them that the knowledge he had gained by past experience placed success in this venture beyond a doubt. While the syndicate was being formed no care was taken to keep the proposed corner a secret, and Gondoriz, when in this country, made the assertion that he would not sell a pound of rubber for less than a dollar, and he did not, as none of the rubber held by him was sold. Manufacturers, profiting by past experience, quietly supplied their wants at this time. The past year has been a favorable one for conservative action on the part of manufacturers, as the demand for rubber goods has fallen somewhat below the average. Rubber has been purchased from time to time of importers outside of

the syndicate in sufficient quantities for manufacturing purposes. No high-priced rubber has been used, consequently no reduction in the price of rubber goods may be expected, unless the price on the crude material should fall considerably below the present cost. It may be of interest to mention, in this connection, that the world's annual crop of rubber is, in round numbers, 60,000,000 pounds, of which 40,000,000 pounds are used in this country. The crop of Para rubber is about 40,000,000 pounds, two-thirds of which is used in the United States. Paras are used in the manufacture of rubber shoes and the tops of rubber boots, being silky and firm, while Central America and other coarser rubbers are suitable for other manufactured goods. The market price of Central America rubber is from 41 to 45 cents a pound.

Strike in Axe Factories.

THE AMERICAN AXE AND TOOL COMPANY are composed of 12 factories, situated at Johnsonville, N. Y.; East Douglas, Mass.; Beaver Falls, Pa.; Cleveland, Ohio; Lewistown, Pa.; Ballston Spa, N. Y.; Jamestown, N. Y.; Gowanda, N. Y.; Mill Hall, Pa.; Bellefonte, Pa.; Oakland, Me., and Nashua, N. H. The employees of the first five named factories of the American Axe Company have gone out on a strike. The cause of the trouble appears to have originated at the Lewistown factory, where the men first went out. The workmen in all the five factories are members of branches of the Federation of Labor, and as the stated wrongs of one branch affect the whole body the men were all ordered out. Both the company and the men have taken a decided stand in the matter. The *Uxbridge Compendium* is authority for a statement purporting to have been made by a prominent member of a local order in East Douglas, to the effect that the president of the American Axe and Tool Company had threatened to break up the order at all hazards, and they wished to demonstrate that they do not intend to be broken up. We are informed that the Federation of Labor have undertaken to pay the striking workmen regular wages during the strike. The factories controlled by the American Axe and Tool Company are important ones, with a large output, and the result of the strike will be watched for with interest by the Hardware trade all over the country.

It Is Reported—

That a new Hardware store is just being opened and stocked by Reed & Sons at 418 Woodland avenue, Philadelphia.

That S. B. Hubbard & Co., Jacksonville, Fla., whose establishment was recently destroyed by fire, will rebuild.

That H. D. A. Grebe has recently commenced the Hardware, Stove and Tin business at Barrington, Ill.

That Kennedy & Bowman are the proprietors of a new Hardware store at Dixon, Ill.

That W. B. Burns is the proprietor of a new Hardware store at Sumter, S. C.

Sliding Display Trays.

CAMPBELL CUTLERY COMPANY, Syracuse, N. Y., are putting on the market Sliding Trays for use in show-cases, as illustrated in Figs. 681 and 682. The tension loops on the Trays are adjustable to the size of the dis-

with him? It is the small town and country ironmongers who can render good assistance in this matter. We know of dozens of firms whose representatives call on the consumer, and whose accounts which were large with the ironmonger at one time are now closed. We can give one instance out of many. Some little time ago a customer of ours required a quantity of Locks to sample. We wrote

have tried the cash system, and if so, what their experience has been. A ventilation of this subject through your columns would no doubt be read with profit.

To Write on Metal.—We have received from a gentleman who is connected with a prominent New England concern the following suggestion as to how to successfully write with ink upon bright metal surfaces. His plan is to rub the surface to be marked briskly with a piece of india rubber. He adds that he has had occasion to mark Silver, Tin and Nickel Sheets, and by following this method has never experienced any difficulty.

Economy in Small Things.—This matter is thus referred to in a recent issue of our Canadian contemporary, *Hardware*, in which the importance of economy in what are usually considered trifling matters is pointed out.

The liberal and large spirit of trade in great centers and large establishments is apt to leave the impression upon the mind of the superficial observer that there is an immense unnecessary waste going on all the time. That appears to be the case. No account seems to be taken of little things, and the refuse heap is supposed to be a costly pile by the end of the year. This is as the fact seems, not as it is, for there is a very careful collection made of the odds and ends that are accounted waste in a large business house. Small dealers are not usually so careful, though to them the extravagance of doing business on a large scale seems greatest. The bits of string, the scraps of paper, the fragments

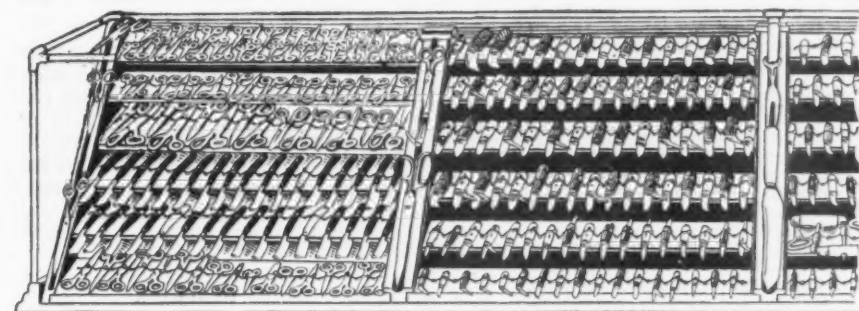


Fig. 681.—Sliding Display Trays.

played article; their wear and breakage is obviated by the novel construction, and each loop is provided with a lifting handle. White erasive tablets are on the back edge of the Trays for marking the number, cost and price of the articles displayed. Original stock boxes can remain on the bottom of the showcase by removing the bottom Tray to the rear of the upper Trays. The top and sides of the standards may be dressed with Scissors, &c., making a fine display of goods. The Trays are removed and placed on the top of the showcase for the inspection of customers. The Trays can be made to fit any showcase, and are finished in canton, velveteen and plush. The advantages claimed for these Trays are that they make the most effective display of goods and keep the stock always in position; that they save case room; that by using them sales are largely increased, and that they save time in selling a Knife, as well as preventing rusty blades. The point is made that the customers are not obliged to handle each Knife to open the blades, as they are already open for inspection, and that they will not rust unless handled. If the blades should become finger marked, the marks can be seen in time to prevent rusting. A customer often will find the Knife he wants through the glass without touching a Knife and before he is waited on.

manufacturer for a price and quoted, but lost the order. On looking up the matter, found that manufacturer had actually quoted our customer 3d. per dozen less than to ourselves. He meant getting the order, and secured it. Will some of the trade give their opinions as to what would be the best way to act? We would suggest an association being formed, so that the members might meet to discuss such matters.

Cash Business.—Referring to the inconvenience and loss entailed by the credit system, as very generally practiced through-

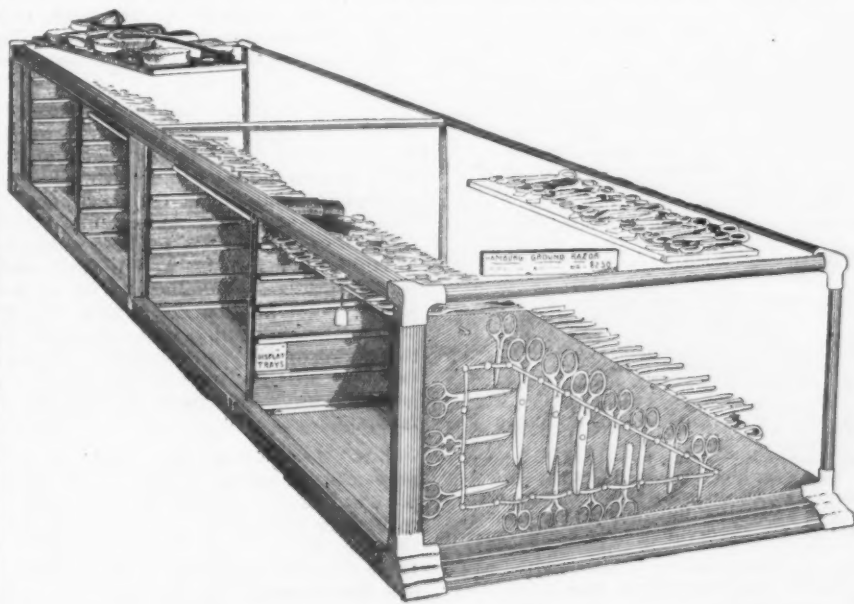


Fig. 682.—Rear of Sliding Display Trays.

Trade Topics.

Selling to Consumers.—That the trade in England suffer from the disposition on the part of manufacturers and the large trade to deal direct with consumers is shown in the following extract from a letter published in a late issue of the *London Ironmonger*:

No doubt ironmongers in every town know that some manufacturers and factors endeavor to do business with the ironmonger as well as the consumer where they can do so without detection. The trade cannot prevent this, but we think some system might be adopted to checkmate them. Cannot ironmongers combine so that the names of these firms may become trade property throughout the country, so that when the representative calls the ironmonger would know how to deal

out the trade, an Ohio correspondent says:

The question as to how to overcome the evils of the credit system is a very important one. I have had 22 years' experience in the Hardware business, and am compelled to carry as much on my books as in stock. Will some one please lift the curtain and permit us who are so oppressed to view the happy land that flows with ready cash?

On the same subject we have the following from a New Jersey Hardwareman, who signs himself "A Victim":

In view of the annoyance, extra expense and actual loss due to the credit system, it would be interesting to the writer to know if there are any Hardware merchants who

of old packing cases, and the numberless remains or ruins of damaged stock, do not go to the pile of debris that is to be carried and deposited out of sight at cleaning up time. They are not swept up. They are very carefully gathered up, assorted, and made into neat looking collections, whose value will tell in a few weeks. In all the big stores of the cities there is a boy employed solely to gather bits of string, paper, &c., whose duties warrant his employment at a fair rate of pay, quite as much as a boy would earn in any other capacity. If this is true of large stores it is no less true of small ones. If a boy can make his pay and something for his employer by saving such scraps from the refuse pile in a large store, it surely will pay storekeepers of all degrees to practice the same economy.

Exports.

PER BARK LILLIAN, AUGUST 26, 1891, FOR CAPE TOWN, SOUTH AFRICA.

By W. B. Fox & Bro.—1 case Tinnets' Hardware, 2 packages Carriage Hardware.

By M. Berliner.—7 packages Scales, 26 packages Hardware, 1 package Lamps.

By R. W. Forbes & Son.—66 kegs Nails, 14 dozen Axes and Hatchets, 2 packages Hardware, 4 packages Agricultural Implements.

By Strong & Trowbridge.—6 dozen Rat Traps, 8 Churns, 3 cases Manila Paper.

By H. W. Peabody & Co.—1 case Pumps, 1 dozen Snaths, 3 crates Stoves.

By Coombs, Crosby & Eddy.—2 dozen Ladders, 43 dozen Carpenters' Tools, 17 dozen Edge Tools, 6 Ladders, 4 dozen Meat Choppers, 6 Sprinklers, 146 pounds Washita Stone, 2 dozen Cages, 9 kegs Nails, 12 Churns, 71 dozen Builders' Hardware, 6 Grindstones, 3 gross Stones.

By W. H. Crossman & Bro.—2 dozen Barrow Parts, 20 dozen Carpenters' Hardware, 4 cases Sash Weights, 1 bundle Snaths, 35 cases Builders' Hardware, 3 reams Flint Paper, 2 cases Carriage Hardware, 2 cases Bird Cages.

PER BARK PUCK, AUGUST 27, 1891, FOR FREEMANTLE, AUSTRALIA.

By R. W. Cameron & Co.—20 dozen Axes, 2 dozen Pumps, 6 Scales, 42 sets Axes, 1 case Carriage Hardware.

By H. W. Peabody & Co.—11 cases Edge Tools, 1 case Builders' Hardware, 4 cases Machine Tools, 4 cases Builders' Hardware, 124 packages Builders' Hardware, 343 pounds Nails, 9 crates Stoves, 3 cases Bolts, 7 cases Axes, 1 case Thermometers, 2 dozen Seed Sowers, 1 case Farming Implements, 1 gross Egg Beaters, 65 cases Cartridges, 1 case Primers, 20,000 Cartridges, 3 dozen Razor Stropps, 1 case Razors, $\frac{1}{2}$ gross Traps, 10 tons Barb Wire, 1 case Traps, 1 package Trowels, 2 packages Hardware, 6 cases Hardware, 2 cases Cartridges, 1 case Rifles, 2 cases Edge Tools, 2 cases Cartridges, 9 cases Hardware, 3 cases Guns, 13 cases Cartridges, 1 case Faucets, 7 packages Lawn Mowers, 1 bundle Step Ladders, 3 packages Hardware, 1 dozen Wringers, 7 crates Churns, 4 cases Scales, 9 cases Stoves, 3 dozen Snaths, 4 packages Churns, 25 cases Edge Tools, 2 packages Hardware.

FOR ALBANY.

By H. W. Peabody & Co.—3 dozen Fly Traps, 58 packages Hardware, 185 pounds Nails, 4 crates Stoves, 1 case Stencils, 330 pounds Bolts, 1 case Thermometers, 1 case Oil Stones, 2 bundles Ladders, 32 cases Cartridges, 2 cases Guns, 4 racks Churns, 6 cases Axes, 2 dozen Egg Beaters, 5 cases Hardware, $\frac{1}{2}$ dozen Wringers, 234 pounds Nails, 35 packages Hardware, 1 case Guns, 30,000 Primers, 40,000 Cartridges, 1 case Boring Machine, $\frac{1}{2}$ gross Egg Beaters, 3 cases Hardware, 24 dozen Edge Tools, 20 cases Cartridges, 1 case Tools.

PER BARK LENCADIA, AUGUST 28, 1891, FOR ADELAIDE, AUSTRALIA.

By Lalance & Grosjean Mfg. Company.—1606 pounds Household Utensils.

By Winchester Repeating Arms Company.—53 cases Cartridges, 3 cases Guns.

By H. W. Peabody & Co.—75 dozen Edge Tools.

By Meriden Britannia Company.—4 boxes, 7 packages and 2 barrels Plated Ware.

By R. W. Cameron & Co.—26 Refrigerators, 1 case Saddlery Hardware, 1 box Nails.

By R. W. Forbes & Son.—4 boxes Carriage Bolts.

By R. H. Dana & Co.—1 case Seythes, 2 cases Bolts, 1 case Flint Paper, 2 cases Bit Braces, 1 case Snaths.

By J. A. Gifford.—1 package Carriage Hardware.

By Arkell & Douglas.—1500 Bolts, 30 dozen Pumps, 18 dozen Carpenters' Tools, 39 dozen Builders' Hardware.

By Mailler & Queureau.—3 cases Wire.

By W. H. Crossman & Bro.—6 cases Pump Parts, 13 packages Grindstone Fixtures, 3 packages Plated Ware, 1 case Lamp Goods, 25,000 Cartridges, 25,000 Primers, 33 dozen Cow Bells, 4 dozen Jacks, 9 dozen Wrenches, 1 gross Hammers, 6 dozen Agate Ware, 224 pounds Stone, 1 case Lamp Goods, 3 cases Builders' Hardware, 1 Churn, 33 dozen Axes, 8 gross Traps, 110 packages Hardware, 50 dozen Faucets, 162 pounds Agate Ware, 3 Saws, 3 crates Builders' Hardware, 12 dozen Traps, 6 dozen Oil Stoves, 800 pounds Nails, 5 cases Builders' Hardware.

By McLean Bros. & Rigg.—122 pounds Oil Stones, 4 dozen Axes, 2 cases Carriage Hardware, 3 cases Saws, 3 cases Hatchets, 15 cases Axes, 11 cases Builders' Hardware, 1 case Anvils and Vises, 1 case Hammers, 1 case Locks, $\frac{2}{3}$ dozen Brace Bits, 50,000 Empty Cartridge Shells, 35,000 Cartridges, 1 case Gun Implements, 1 case Pumps, 1

case Rifles and Pistols, 12 dozen Mouse Traps, $\frac{3}{4}$ dozen Augers, 9 gross Snaps, 7 dozen Hammers, 24 dozen Gate Latches, 1 Level, 6 dozen Cork Pullers, 5 cases Carriage Hardware, 35 cases Builders' Hardware.

PER SHIP SOUTHERN CROSS, AUGUST 29, 1891, FOR SYDNEY, N. S. W.

By J. L. Mott Iron Works.—46 packages stoves.

By L. H. Mace & Co.—47 Refrigerators.

By W. & B. Douglas.—7 boxes Pumps.

By J. A. Gifford.—3 packages Hardware.

By Winchester Repeating Arms Company.—100 Guns, 50 sets Tools, 70 Guns, 10,000 Cartridges.

By Healy & Earl.—3 cases Pumps, 1 case Saws, 2 boxes Emery Wheels, 1 box Rivets.

By Arnold, Cheney & Co.—9 cases Hardware.

By Coombs, Crosby & Eddy.—7 dozen Rakes, 1 dozen Carpet Sweepers, 178 pounds Household Hardware, $\frac{1}{4}$ dozen Lamp Goods, 148 dozen Tackle Blocks, 2 dozen Lanterns.

By W. E. Peck.—2 cases Plated Ware, 1 case Hardware.

By Strong & Trowbridge.—20 dozen Axes, 249 pounds Hardware, 1 dozen Hardware, 45 pounds Washers, 1 case Hardware.

By R. W. Cameron & Co.—1 box Belting.

By McLean Bros. & Rigg.—12 dozen Rat Traps, 6 Cultivators, 21 dozen Cow Bells, 13 dozen Hammers, 45 Churns, 35 dozen Axes, 46 dozen Hatchets, 24 dozen Hatchets, $\frac{2}{3}$ dozen Wrenches, 36 dozen Hardware, 50,000 Cartridges, 68 Rifles, 20 Rifles, 1 case Cartridges, 2 gross Rat Traps, 10 dozen Bush Hooks.

By H. W. Peabody & Co.—5 cases Guns, 16 packages Hardware, 12 racks Churns, 2 cases Wire Goods, 30 dozen Hoes, 13 packages Hardware, 2 cases Bolts, 21 cases Lanterns, 4 packages Builders' Hardware, 18 dozen Hoes, 4 cases Edge Tools, 1 case Fire Arms, 2 cases Edge Tools, 15 bundles Hose Reels, 12 dozen Forks, 3 cases Hardware, 2 crates Sandpaper, 2 packages Road Scrapers.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Manufacturers and jobbers have experienced a comparatively uneventful week. Nothing has occurred in any branch of the trade that would tend to disturb values or prompt anything out of the usual routine in buyers' or sellers' movements. The position of the markets for base materials generally seems to be well defined, and favors steadiness to values, as far as the item of cost may be concerned. Goods are moving off about as they usually do at this season of the year, competition is temperate in all lines, and the outlook for a good fall season distribution is considered favorable.

White Lead.—Corrodors note an improvement in orders for some of the more popular brands of pure pigment and a reasonably good trade in certain descriptions of Mixed Leads is also spoken of. Upon the whole, the movement of supplies into the channels of consumption would thus appear to be satisfactory. Prices for corrodors' product are firmly maintained at first hands, as are also those for the better class of mixtures, but some irregularity is still noted in rates made to retailers by jobbers. The experience in this connection, however, differs in no marked degree from what has been common of late.

Zincs.—For domestic Oxide the market remains quiet and is devoid of new feature. Manufacturers are accumulating some supply, as not unusual at this season of the year, but the surplus does not appear to be burdensome, nor is there any shading of the combination prices. In foreign brands the movement is momentarily on a moderate scale, but importations are gauged closely by the outlet, and in the absence of any change by manufacturers former prices prevail in this market.

Colors.—Some improvement is noted in sales of a few of the more staple lines of

Dry Colors used by grinders, and the distribution of house painters' specialties is also represented as being rather better now than it was a week ago. Oil Colors and mixed Paints are selling fairly. In prices the changes are few and unimportant, the general market retaining a fairly firm tone. No increase in orders for Paris Green or other insecticides is noted, although reports from some sections of the South state that there is still a very good demand in that quarter.

Miscellaneous.—Block Chalk has been sold in moderate quantities at \$2 on the spot, but cargoes do not appear to be wanted at present. New orders for Whiting have been moderate, but free movement on old contracts serves to keep the market in good shape and hold prices steady. Paris White is unchanged. Clays in general are rather quiet at the moment, but steady as to prices.

Oil Market.

The market for nearly all descriptions of Animal and Vegetable Oils has been rather quiet throughout the week, and devoid of specially new feature. Export interest in the varieties that go to foreign markets is momentarily absent, and home buyers manifest little interest aside from providing for imperative wants. Considerable interest centers in the prospects for the new Cotton Oil season now that various reports of damage to the growing crop are in circulation, and the progress of the Menhaden fishing is also attracting more or less attention. Buyers manifest no inclination to discount possible shortage, however, and sellers are slow to offer pending developments. In other lines the surroundings are uninteresting.

Lined Oil.—The situation remains precisely as outlined last week, except that a rise in the cost of seed has served to give the previous firmness of the market greater soundness. No out-of-town brands are offered in this market at less than 40¢ by manufacturers' representatives, and that price is shaded only to a slight extent by dealers who stocked up when prices were at the lowest point. In the New England market 41¢ is asked. City crushers adhere to the prices that have ruled for several weeks, and report a good, steady trade.

Cotton-Seed Oil.—Spot stock of crude is light and chiefly of poor quality, some of which has been sold at as high as 28¢. New crop has been taken for October delivery at 29¢ @ 30¢, which would indicate a firm market at the beginning of the new season. Sales of refined in this market are hardly up to the late average, but several thousand barrels have been consigned direct from the South to European markets, and the offering at present is not particularly heavy. Prime stock is steadily held at old prices, but low grades are irregular, with a tendency in buyers' favor, and 30¢ said to have been accepted for reddish color stock.

Fish Oils.—Report from the Maine coast state that the Menhaden fishing is still very poor and that the output of Oil thus far is considerably short of what will be necessary to fill orders that were booked early in the season. At other points the supply is also moderate. Prices for Crude products are therefore very firm, and manufacturers offer the Pressed and Bleached Oils sparingly, pending developments.

Sperm and Whale Oils.—In the New Bedford market there have been transactions involving a total of about 390 barrels crude Sperm at under 70¢, and 150 barrels Arctic Whale at 45¢. Those prices are somewhat below what holders have been asking of late, but do not appear to have any effect upon the market for refined products.

The North Star Kitchen Cabinet.

The G. M. Shirk Mfg. Company, 112 and 114 Lake street, Chicago, have brought out what promises to be a very useful and popular article in the line of house-furnishing goods. It is a combined kitchen table, flour bin, sugar bin, spice cabinet and receptacle for miscellaneous kitchen sta-

foot, and the whole is revolved smoothly into its place. The top of the revolving section forms a kneading board, which lifts off and opens up bins for flour, sugar, &c., the full depth of the cabinet. The bins are made of three-piece wood stock to keep the sides perfectly tight. Small drawers, held in place by springs, are arranged on the side for spices, and there are larger drawers below on both

lower part of the frame. The outfit is packed in a box ready to be placed in position, with push button, staples and 70 feet of insulated wire. No electric skill

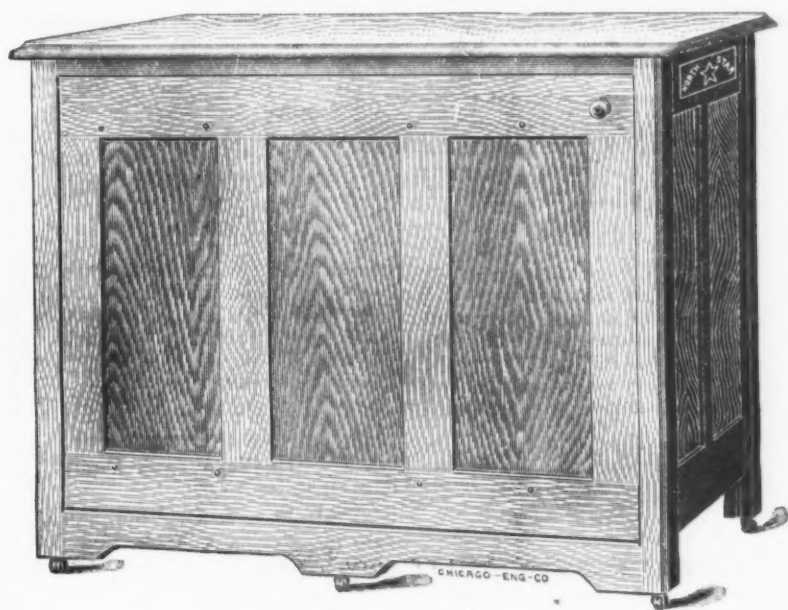


Fig. 1.—North Star Kitchen Cabinet.

ples. Illustrations are herewith given, Figs. 1 and 2, showing the cabinet both closed and open. It is made of maple, finished in the natural wood, mounted on casters, and is 24 inches wide, 44 inches long and 34 inches high. The frame work is not only mortised together, but is also strengthened with heavy bolts to sustain the weight of the contents when bins

sides. A place is provided for a rolling pin. The entire arrangement shows great ingenuity.

Nassau Door Bell Outfit.

The Nassau Electrical Company, 112 White street, New York, are putting on



Nassau Door Bell Outfit.

is required in putting this up, nor does it need any subsequent attention. When the capsule battery is exhausted the cap is removed and a fresh capsule inserted, the operation not occupying more than a minute. The compactness of the package and absence of wet batteries will be appreciated by the hardware trade. These outfits are finished in nickel, copper and bronze, presenting a neat and attractive appearance.

Ideal Sash Pulley No. 55.

Stover Mfg. Company, Freeport, Ill., are introducing to the trade, a sash pulley, as illustrated herewith. It has cone bearings, which are referred to as rendering the operation of the pulley practically noiseless, as the wheel runs midway between the two walls or sides of the case. Atten-

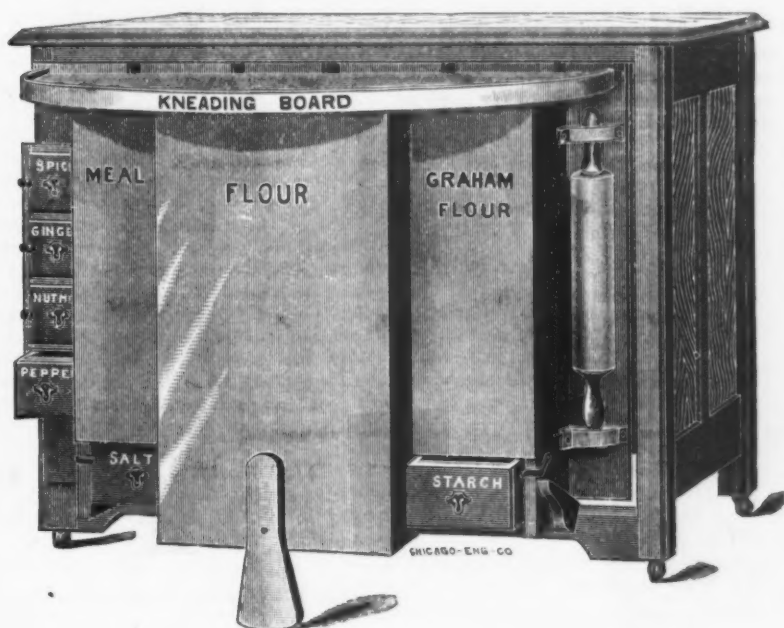
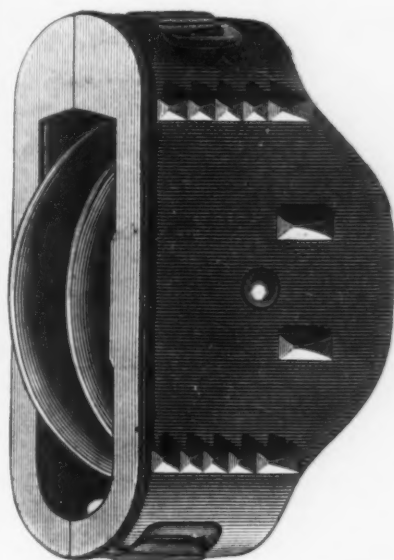


Fig. 2.—Kitchen Cabinet Open.

and drawers are filled. The entire interior of the cabinet is connected with the front section, which is pivoted in the center and revolves. As it swings forward a catch drops against the framework, which holds the cabinet firmly in position, while a front support or leg rests on the floor. In closing the cabinet the catch is lifted by the operator's

the market an improved style of door bell outfit, as illustrated herewith. The metal cap which covers the dry capsule battery and coil is cast in one piece. This is fastened to a polished oak board or frame by one screw, and can be removed at will. A nickel plated bell is fastened to the same frame above the cap. Binding posts for attaching the insulated wire are at the



Ideal Sash Pulley No. 55.

tion is called to the fact that the friction is reduced to a minimum, on account of its cone bearings and the improved method of manufacture. The pulley is of special design, adapted to the needs of the house builder or mill men. It has markers on either side for spacing the distance to bore holes, and barbed ribs for holding the pul-

ley in place. It is claimed that the pulley fits equally well on auger or machine mortise, and that it is a perfect fit, needing no screws or nails to keep it in position.

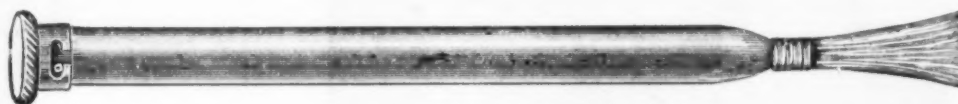
Economy Fountain Brush.

Economy Fountain Brush Company, 409 and 411 East Fayette street, Baltimore, Md., are offering the trade a marking brush, as illustrated herewith. The brush

The Little Wonder Cash Carrier.

Utility Mfg. Company, 110 Genesee avenue, Saginaw, Mich., are introducing a cash carrier, as illustrated herewith. The propelling power is obtained from the tightening of two cords passing through two eyelets on the carrier. The carrier is made of solid brass and steel, nickel plated. The point is made that it has no wooden cups to break, no springs or catches

Bowling Green, adjoining the tall Washington Building, which is 163 feet front by 200 feet deep, and the scheme is to erect on this a 20-story building, with a six-story tower, whose dome shall be 550 feet above the street. The plan contemplates a solid steel building, "as solid as if originally a block of steel, in which halls and corridors and offices were tunneled." The steel case will be surrounded with walls of stone and terra cotta, but these walls will be supported by

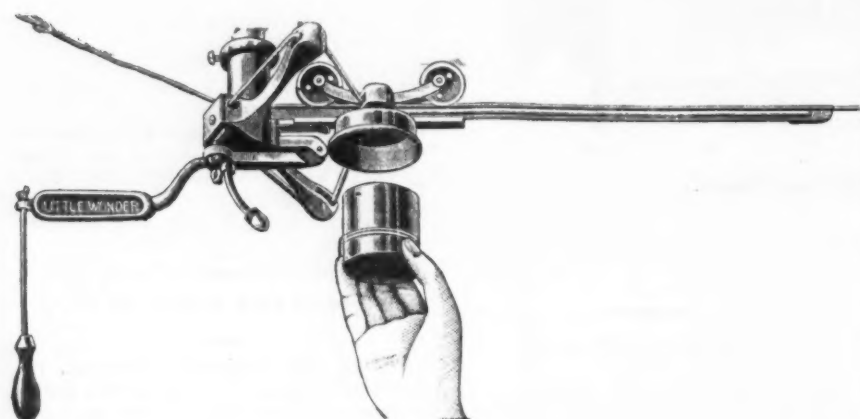


Fountain Marking Brush.

is of such a shape as to be very convenient for use in the practical purposes of marking, while the tube or handle contains a supply of ink, which flows in such a way as to avoid the unpleasant interruption incidental to dipping the brush in ink. The barrel of the brush is nickel

to get out of order or no rubber to pull apart. It is claimed that the speed of the car is easily controlled, that it travels almost noiselessly and that it will do perfect work on curves and inclines. The carrier is adapted to carrying cash, pass books, change and credit slips. The systems are

the case rather than be the support of the building. The estimated cost of this structure, which will overtop the towers of the Cologne Cathedral, is about \$4,000,000. Charles W. Dayton owns the property, and is trying to get together the capital necessary to carry the project through.



The Little Wonder Cash Carrier.

plated, and in all respects the article is neatly and carefully made. It has the advantage of always being ready, with no

as nominal, the system paying for itself in a short time. A Little Wonder Parcel Car-

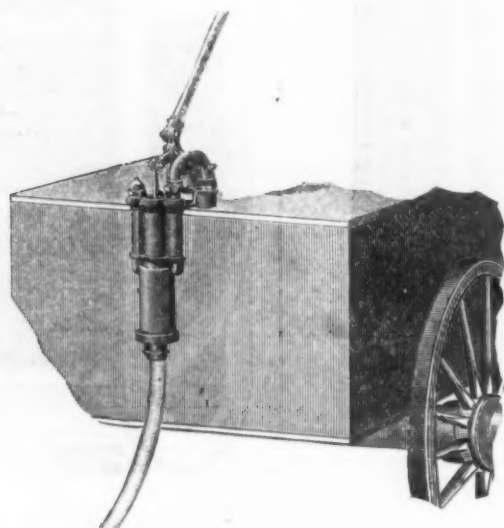


Fig. 1.—Buckeye Tank Pump.

chance for the ink to evaporate. Further, there is no cup or pot of ink to be overturned and no chance of the hands being soiled. The Economy Fountain Brush is sent out accompanied by a supply of ink. New tips are supplied as needed, and are readily put in place.

rier, which is of larger capacity, is constructed on the same principles.

An office building 550 feet high is the latest proposition. There is a vacant lot on the west side of Broadway, opposite

Buckeye Tank Pump.

Mast, Foos & Co., Springfield, Ohio, are introducing a Tank Pump, as illustrated in Fig. 1. The pump is constructed with a 5-inch enameled lower and brass upper double acting cylinder, as shown in Fig. 2, and is conveniently arranged to attach to a tank, into which it may be desired to discharge water. The handle is adjustable to the position desired by the operator. Hose may be attached to the

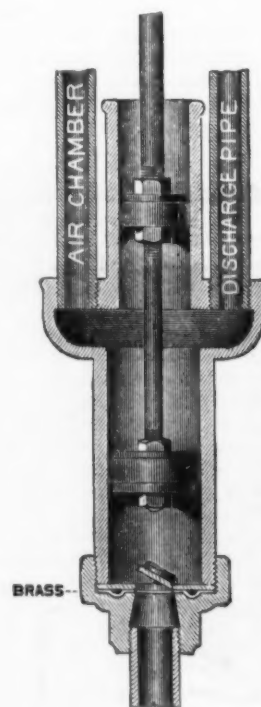


Fig. 2.—Working Parts of the Pump.

pump for washing out boiler flues, protection against fire, &c. The pump is accompanied by couplings and strainer for suction hose, and coupling for discharge hose.

Twenty-five locomotives on the Baltimore and Ohio road have been equipped with smoke consumers, an invention of the superintendent of motive power on the Baltimore and Ohio, which is said to be showing excellent results so far as it has been tested.

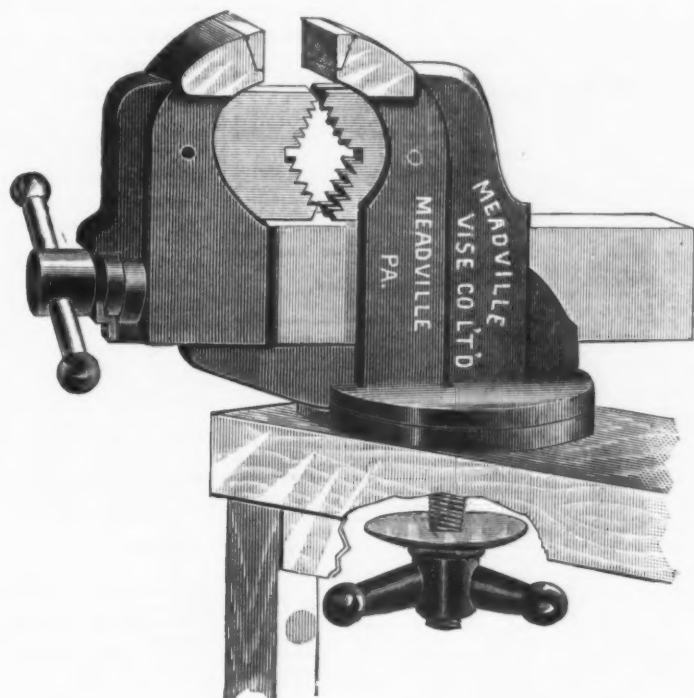
Steel Bar Pipe Vise.

Meadville Vise Company, Meadville, Pa., are putting on the market a pipe vise, as illustrated herewith. This is cast by their improved process with iron, making steel and iron one continuous piece. The vise is described as having a malleable nut, that can be replaced when worn out; wrought-iron screw, file-cut jaws, steel jaws for holding pipe, of best refined steel, case hardened. The vise is referred to as well finished, and as presenting a

plate manufacturers is overproduction, and to see the bearing of this it will be necessary to look somewhat closely into excess stocks in United States at date. To ascertain the normal demand from the States, it will be fair to take the two years 1889 and 1890, for during the former imports were exceptionally heavy and resulted in the accumulation of large stocks, so that imports in 1890 were on a lighter scale. Taking these two years together we find the average monthly shipments were 27,283 tons. This would make at the same

from this it further follows that there will not, during the months of July, August, September and half of October, be work for more than half of our production.

Makers will have to direct their attention very seriously to this condition of affairs. The only result of producing largely in excess of demand will be, as it has been in the past, to bring about prices at which large losses will be incurred. It is not a question of syndicate or combining to make increased profits, but the serious one of avoiding excessively heavy and unnecessary loss.



Steel Bar Pipe Vise.

fine appearance. The manufacturers state that any defective parts will be replaced without charge.

Stocks of Tin Plate in America.

In times of political and industrial agitation there is apt to be a lot of mysterious publications begotten and brought forth in secrecy and finally given to the public with no hint as to their parents or sponsors. Of this class is a brochure on the tin-plate question, published in Liverpool about the time the new tariff went into effect. Some anonymous friend sends us a copy of this pamphlet, which we are glad to notice in our columns. The publication, bound in cloth and handsomely printed, measures but 4 x 5 inches, and contains but 14 pages. It is entitled "The McKinley Bill and the Tin-Plate Position," and the frontispiece is a photograph of Major McKinley. The author, who writes apparently in the interests of the Welsh maker, shows what the additional duty amounts to per standard box, and addresses a few words to the American consumer, whom he thinks will not be benefited by the change. A brief history of the Tariff bill is given, and then a kind of half prognostication that a new Congress will repeal the bill. A review of the American works follows, together with an extract from an address delivered by Hon. T. Bunting, at Chicago, May 7, 1891, before the Canned Goods Packers' Association, and closes with an account of the oversupply to the United States and its bearing upon the Welsh makers. From the closing pages of the pamphlet we quote as follows:

The chief immediate danger to the tin-

rate for 1891 up to the end of June 1889, 698 tons, and actually 263,225 tons were shipped, or an excess of 99,527 tons. It may be urged that part of this is the natural increase which experience shows us goes on every year, but against this it is only fair to put the *natural reduction in the import for re-exportation, so that we are quite entitled to assume that the whole excess is excess stock. Following on the same line we find that this excess stock at the estimated import of 27,283 per month will keep the United States out of the market for everything except a few lines of odd sizes for over three months. During this time our English tin-plate manufacturers must look for their customers to the oil trade, American and Russian, the Continent, other foreign countries, and home consumption. It becomes of importance to see what these other sources of consumption amount to. On again taking the combined figures for 1889 and 1890, we find that there were exported to the United States during these years 654,797 tons. Of these, from the United States returns of Drawback, about one-fifth were re-exported, so that the United States during these years consumed within itself 523,838 tons. Deducting this from the total shipped, we find the export demand outside the United States was 194,578 tons. The English home consumption amounts to about 238,883 tons per annum. The results we then arrive at are that of the whole quantity made the United States take about 327,399 tons per annum, and

* Under the McKinley tariff re-exporters get a drawback of 90 per cent. of the duty. This at present prices amounts to their paying the nominal duty of $\frac{1}{2}$ per cent. whereas under the old tariff they got back 90 per cent. of the duty and paid about $2\frac{1}{2}$ per cent. of the value.

Bicycle Tournament.

A bicycle tournament will be held at Peoria, Ill., on the 18th, 19th, 21st and 22d of the present month. It is expected that fully 200 racing men will participate in these races, among which will be the fastest men both East and West. A list of prizes amounting to \$5133, exclusive of special medals, has been offered to induce the best racing talent to be present. The Peoria track is extremely fast, being composed of an exceedingly fine clay, susceptible of retaining a hard, smooth surface, and 25 of the present world records are credited to it. The first and second days will be devoted to $\frac{1}{4}$, $\frac{1}{2}$, 1, 2 and 5 mile races; and the third and fourth days to record breaking contests.

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Clamps—

R. I. Tool Co.'s Wrought Iron.....25¢
Adjustable, Cincinnati.....15¢10¢
Adjustable, Hammers.....15¢
Adjustable, Stearn's.....30¢30¢10¢
Stearns' Adjustable Cabinet and Cor-
ner.....30¢30¢10¢
Cabinet, Sargent's.....60¢10¢
Carriage Makers'.....70¢10¢
Carriage Makers' P. S. & W. Co.....40¢10¢
Eberhard Mfg. Co.....40¢10¢40¢10¢
Parallel, C. H. Bealy & Co.....25¢
Warner's.....40¢10¢40¢10¢5¢
Saw Clamps, see Vices, Saw Filers.
Carpenters', Cincinnati.....25¢10¢

Cleavers.

Butchers'.
Bradley's.....25¢30¢
L. & J. White.....20¢25¢
Beatty's.....40¢40¢5¢
New Haven Edge Tool Co.'s.....40¢
P. S. & W.....35¢25¢35¢40¢10¢
Foster Bros.....30¢
Schulte, Lohoff & Co.....40¢40¢5¢

Clips—

Norway, Axle, 1/4 & 5-16.....55¢55¢5¢
2nd grade Norway Axle, 1/4 & 5-16.....65¢
Superior Axle Clips.....65¢45¢70¢
Norway Spring Bar Clips, 5-16.....60¢55¢5¢
Wrought-Iron Felloe Clips.....5¢
Steel Felloe Clips.....5¢
Baker Axle Clips.....25¢

Cloth and Netting, Wire—See
Wire, &c.

Cockeyes.....50¢

Cocks, Brass.....50¢25¢

Coffee Mills—See Mills, Coffee.

Collars, Dog, &c.

Medford Fancy Goods Co.....40¢10¢
Embossed, Gilt, Pope & Steven's list
30¢10¢
Leather, Pope & Steven's list.....40¢
Brass, Pope & Steven's list.....40¢
Chapman Mfg. Company.....50¢10¢40¢

Combs, Curry.

Fitch's.....50¢10¢50¢10¢10¢
Rubber, per doz \$10.00.....20¢
Perfect.....50¢
Kellogg's.....50¢10¢
Sweet & Clark's.....50¢10¢

Compasses, Dividers, &c.

Compasses, Calipers, Dividers, 70¢70¢10¢
Bemis & Call Co.'s.....60¢5¢
Dividers.....60¢5¢
Compasses & Calipers.....50¢5¢
Wing and Inside or Outside.....50¢5¢
Double.....60¢
(Call's Pat. Inside).....30¢
Excelsior.....50¢
J. Stevens & Co.'s.....25¢10¢
Starrett's.....25¢10¢

Spring Calipers and Dividers.....25¢10¢

Lock Calipers and Dividers.....25¢

Combination Dividers.....25¢

Coopers' Tools—See Tools, Coopers'.

Cord—

Sash.

Common.....5¢, 10¢, 11¢
Patent, good quality.....5¢, 12¢, 13¢
White Cotton Braided, fair.....24¢40¢2¢
Common Russia Sash.....5¢, 12¢, 13¢
Patent Russia Sash.....5¢, 12¢, 13¢
Cable Laid Italian Sash.....5¢, 21¢22¢
India Cable Laid Sash.....5¢, 12¢
Silver Lase.....25¢

A Quality, White, 50¢.....25¢

A Quality, Drab, 55¢.....25¢

B Quality, White, 30¢.....10¢

B Quality, Drab, 35¢.....10¢

Sylvan Spring Extra Braided White, 34¢

Sylvan Spring Extra Braided, Drab, 39¢

Semper Idem Braided, White.....30¢

Egyptian, India Hemp, Braided.....25¢

Massachusetts, White.....25¢

Samson.....30¢

Braided, White Cotton, 50¢.....30¢30¢5¢

Braided, Drab Cotton, 55¢.....30¢30¢5¢

Braided, Italian Hemp, 55¢.....30¢30¢5¢

Braided, Linen, 80¢.....30¢30¢5¢

Tate's Cotton Braided, White.....30¢30¢5¢

Wire Picture.

Braided or Twisted.....75¢10¢

Corkscrews—See Screws, Cork.

Corn Knives and Cutters—See

Knives, Corn.

Crackers, Nut—

Table (H. & B. Mfg. Co.).....40¢

Blake's Pattern.....5¢ doz \$2.00, 10¢

Turner & Seymour Mfg. Co.....50¢

Cradles—

Grain.....50¢55¢20¢30¢10¢25¢

Crayons.

White Crayons, gross.....10¢

D. M. Stewart Mfg. Co., Metal Work-
ers, gr. \$2.50.....25¢

D. M. Stewart Mfg. Co., Rolling Mill,
gr. \$2.50.....25¢

See also Chalk.

Crow Bars—See Bars, Crow.

Curry Combs—See Combs, Curry.

Curtain Pins—See Pins, Curtain.

Cutters—

Meat.

Dixon's # dos.....40¢25¢

Nos.....1 2 3 4

\$14.00 \$17.00 \$19.00 \$30.00

Woodruff's # dos.....40¢25¢

Nos.....100 150

\$15.00 \$18.00

Sales Pattern # dos.....70¢70¢5¢

Nos.....\$7.00 \$23.00 \$45.00

American.....30¢

Nos.....1 2 3 4 5 6

Each.....\$5 \$7 \$10 \$25 \$50 \$60

Enterprise.....30¢

Nos.....12 25 35 45

Each.....\$3 \$5 \$8 \$10 \$15

Great American Meat Cutter.....30¢

Nos.....112 116 118 120 122

Each.....\$3.00 \$2.75 \$3.00 \$3.50 \$4.00

Miles' Challenge # dos.....45¢45¢10¢

Nos.....1 2 3

\$23.00 \$30.00 \$40.00

Horne No. 1.....# dos, \$36.00, 55¢10¢

Draw Cut, each:

Nos. 5 6 8 10
\$50 \$75 \$80 \$225.....20¢25¢
Great American.....30¢
Beef Shavers (Enterprise).....20¢10¢30¢
Little Giant (P. S. & W. Co.).....50¢
Chadborn's Smoked Beef Cutter, # dos
\$60.00

Tobacco.

Champion.....20¢10¢30¢
Wood Bottom.....# dos \$5.00 \$5.25
All Iron.....# dos \$4.25
Nashua Lock Co.'s, # dos, \$18.00 50¢55¢
Wilson's.....55¢
Sargents's.....# dos, \$24, 55¢10¢
Acme.....# dos \$20.00, 40¢

Washer.

Smith's Pat.....# dos \$12.00, 20¢10¢10¢
Johnson's.....# dos \$11.00, 35¢
Penny's, # dos Pol. #14; Jap'd, \$16.00, 55¢
Appleton's.....# dos \$16.00, 60¢10¢
Bonney's.....30¢10¢
Cincinnati.....25¢10¢

Dampers, &c—

Dampers, Buffalo.....40¢10¢
Buffalo Damper Clips.....40¢10¢
Crown Damper.....40¢
Excelsior.....40¢10¢

Diggers, Post Hole, &c—

Samson Post Hole Digger, # dos \$36.00, 25¢
Fletcher Post Hole Augers, # dos \$28, 20¢
Eureka Diggers.....# dos \$12.50 \$14.00
Lead's.....# dos \$3.00 \$9.00
Vaughan's Post Hole Auger, # dos
\$13.00 \$14.00
Kohler's Little Giant.....# doz. \$18.00
Kohler's Hercules.....# doz. 15.00
Kohler's New Champion.....# doz. \$9.00
Schniedler.....# doz. \$18.00
Ryan's Post Hole Diggers.....# doz \$24.00
Cronk's Post Bars, # dos \$60.00,
50¢5¢50¢10¢
Gibbs Post Hole Digger, # dos \$30.00, 50¢
Imperial, # dos \$15.....40¢

Dividers—

See Compasses.

Dog Collars—See Collars, Dog, &c.

Door Springs—See Springs, Door.

Drawers.

Money, # dos.....\$18¢20¢

Drawing Knives—See Knives,

Drawing.

Drills and Drill Stocks—

Blacksmith's.....each \$1.75
Blacksmith's Self-Feeding, each \$7.50, 20¢
Breast, P. S. & W.....40¢10¢
Breast, Wilson's.....40¢10¢
Breast, Millers Falls.....each \$3.00, 25¢
Breast, Bartholomew's.....each \$2.50,
25¢10¢40¢
Ratchet, Merrill's.....20¢20¢5¢
Ratchet, Ingersoll's.....30¢20¢5¢
Ratchet, Parker's.....30¢20¢5¢
Ratchet, Whitney's.....20¢10¢
Ratchet, Weston's.....20¢25¢
Ratchet, Moore's Triple Action.....30¢30¢
Ratchet, Curtis & Curtis.....30¢
Whitney's Hand Drill, Plain, \$11.00,
Adjustable, \$12.00.....20¢10¢
Wilson's Drill Stocks.....10¢
Automatic Drilling Tools.....\$1.75 \$1.80

Drill Bits—See Augers and Bits.

Drill Chucks—See Chucks.

Dripping Pans—See Pans, Dripping.

Drivers, Screw.

Douglas Mfg. Co.....20¢30¢10¢
Disston's.....50¢
Buck Bros.....30¢
Stanley R. & L. Co.'s
Varnished Handles.....65¢10¢
Black Handles.....60¢10¢
Sargent & Co.'s.....60¢10¢

No. 1 Forged Blade.....60¢10¢10¢

Nos. 20, 30 and 60.....60¢10¢10¢

P. S. & W.....70¢

Knapp & Cowles:

No. 1.....60¢10¢70¢

No. 2.....60¢10¢10¢70¢5¢

No. 3.....60¢5¢60¢10¢

Nos. 4 and 60, Acme and Ideal.....5¢50¢10¢5¢

Stearns.....25¢10¢25¢

Gay & Parsons.....25¢

Champion.....25¢10¢

Clark's Pat.....30¢35¢

Crawford's Adjustable.....30¢

Ellrich's Socket and Ratchet.....25¢25¢10¢

Allard's Spiral, new list.....25¢

Kohl's Common Sense # dos \$0.20, 25¢10¢

Syracuse Screw-Driver Bits.....30¢30¢5¢

Screw-Driver Bits.....# dos. 50¢75¢

Screw-Driver Bits, Parr's.....# gr \$0.25

Fray's Hol. Hdle. Sets. No. 1.....25¢

P. D. & Co.'s all Steel.....50¢

Cincinnati.....25¢10¢

Brace Screw Drivers.....25¢10¢

Buck Bros' Screw-Driver Bits.....

Egg Beaters—See Beaters, Egg.

Egg Pouchers—See Pouchers, Egg.

**Electric Bell Sets—See Bells, Elec-
tric.**

**Emery.—No. 4 to No. 54 to Flour CF
40 gr. 150 gr. 175 gr.**

Kegs, # dos.....45¢ 5¢ 25¢
1/2 kegs, # dos.....45¢ 5¢ 25¢
3/4 kegs, # dos.....5¢ 5¢ 3¢
10-lb cans, 10
in case.....5¢ 5¢ 5¢
10-lb cans, lower
than 10.....10¢ 10¢ 7¢

Enamelled and Tinned Ware—

See Ware, Hollow.

**Escutcheon Pins—See Pins, Es-
cutcheon.**

Escutcheons.

Door Lock.....Same dis as Door Locks.

Brass Thread.....60¢60¢10¢

Expanded Metal.

List No. 5.

Lathing.....10¢

Fencing, Painted Sheets.....20¢

Netting, Painted Sheets.....20¢

Door Mats, Galvanized.....25¢

Window Guards, Painted.....15¢

Tree Guards, Painted.....15¢

Extractors, Lemon Juice—See
Squeezers, Lemon.

Fasteners, Blind—

Mackrell's, # dos. \$1.00.....20¢20¢10¢
Van Sand's Screw Pat. #15 # gr. 30¢10¢
Van Sand's Old Pat. #15.00 # gr. 55¢10¢
Washburn's Old Pattern, # gr. 30¢
Merriman's.....new list.

Austin & Eddy No. 2008 # gr. \$4.00

Security Gravity, # gr.....\$0.00

Finishes.—

Fenn's.....40¢

Bohren's Pat. Rubber Ball.....25¢

Fenn's Cork Stops.....35¢

Star.....60¢

Frary's Pat. Petroleum.....40¢5¢25¢

B. & L. B. Co.....

West's Lock, Open and Shut Key.....50¢

Star, Metal Plug, new list.....40¢

Lockport, Metal Plug, reduced list.....60¢

Metallic Key, Leather Lined.....60¢10¢

Cork Lined.....70¢5¢70¢10¢

Burnside's Red Cedar.....50¢

Burnside's Red Cedar, bbl lots.....50¢10¢

John Sommers'.....

Peerless Best Block Tin Key.....40¢

IXL, lat quality, Cork Lined.....50¢

Diamond Lock.....40¢

Perfection, Fla. Red Cedar.....50¢

Goodenough Cedar.....50¢

Boss Metallic Key.....60¢

Reliable Cork Lined.....60¢

Western Pattern Cork Lined.....50¢

Self-Measuring.....

Enterprise, # dos \$50.00.....20¢10¢

Lane's, # dos \$5.00.....25¢10¢

Victor, # dos \$35.00.....25¢10¢

Felloe Plates—See Plates, Felloe.

Fifth Wheels—

Derby and Cincinnati.....45¢5¢

Brewster.....50¢5¢

Files—

Domestic—

Nicholson Files, Rasps, &c.....60¢10¢60¢10¢5¢

Nicholson (X. F.) Files.....25¢

Nicholson's Royal Files (Seconds).....75¢

(extra prices on certain sizes)

G. & H. Barnett (Black Diamond).....

Angle.....60¢10¢50¢10¢10¢

Other makers, best brands 60¢10¢60¢20¢

Fair brands.....70¢10¢70¢5¢

Second quality.....70¢10¢75¢10¢

Heller's Horse Rasps.....50¢7¢50¢10¢

McCaffrey's Horse Rasps.....50¢10¢

Chesnut Horse Rasps, Hand Cut.....50¢10¢

Moss & Gamble.....List, April 1, 1883, 15¢

Butcher's, list, 30¢

Stubs.....Stubs list, 25¢30¢

Turton's.....Turton's list, 20¢25¢

Greaves' Horse Rasps, American list, 60¢

Fixtures.

Grindstone—

Sargent's Patent.....70¢10¢

Reading Hardware Co.....80¢10¢

P. S. & W. Co.....60¢10¢

Fluting Machines—See Machines,

Fluting.

Fluting Scissors—See Scissors,

Hangers—

Barn Door, old patterns.....	60&10&10&70
Barn Door, New England.....	60&10&10&70
Samson Steel Anti-Friction.....	55
Orleans Steel Wrought Wood Track.....	55
Hamilton Wrought Wood Track.....	55
U. S. Wood Track.....	55
Champion.....	60&10
Rider and Wooster, Medina Mfg. Co.'s List.....	70
Climax Anti-Friction.....	55
Climax Anti-Friction for Wood Tracks.....	55
Zenth for Wood Track.....	55
Reed's Steel Arm.....	50
Challenge, Barn Door.....	50
Sterling.....	50&50&10
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00.....	50&25
Cherished.....	50&10&60
Kidder's.....	50&10
The Boss.....	60&10
Best Anti-Friction.....	60&10
Duplex (Wood Track).....	60&10&5
Terry's Pat., 7 doz pr. 4 in., \$10.00; 5 in., \$12.00.....	50&10
Terry's Steel Anti-Friction Leader 50&10	
Terry's Steel Anti-Friction Ideal.....	50&10
Cronk's Patent, Steel Covered.....	50&5
Wood Track Iron Clad, 7 ft. 10 in.....	50
Carrier Steel Anti-Friction.....	50&10
Architect, 7 set \$6.00.....	20
Eclipse.....	20&10
Felix, 7 set \$4.50.....	50&10
Richards.....	30&30&10
Lane's Standard.....	50&50&10
Lane's New Standard.....	50&50&5
Ball Bearing Door Hanger.....	50&10&25&10
Warner's Pat.....	20&10&20&10&10
Stearns' Anti-Friction Leader 50&10	
Stearns' Challenge.....	25&10&25&10&10
Faultless.....	40&40&5
American, 7 set \$6.00.....	20&10
Rider & Wooster, No. 1, 62¢; No. 2, 75¢.....	40
Paragon, Nos. 1, 2 and 3.....	40&10
Cincinnati.....	25&10
Paragon, Nos. 5, 5 1/2, 7 and 8.....	20&10
Crecent.....	60&60&10
Nickel Cast Iron.....	50
Nickel, Malleable Iron and Steel.....	40
Seranton Anti-Friction Single Strap 3/4 in. Wheel, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00.....	45
May.....	40&10&40&10&5
Barry, 80.00.....	50&50&50&10
Interstate.....	40&10
Magie.....	50

Harness Snaps—See Snaps.**Hatchets—**

American Axe and Tool Co.	
Blood's.....	
Hunt's.....	
Hurd's.....	
Mann's.....	
Peck's.....	
Underhill's.....	
Buffalo Hammer Co.....	40 & 10
Fayette R. Plumb.....	50&5
C. Hammond & Son.....	
Kelly's.....	
Sargent & Co.....	
F. S. & W. Co.....	
Ten Eyck Edge Tool Co.....	
Collins.....	10
Schulte, Lohoff & Co.....	50&50&5

Hay and Straw Knives—See Knives.**Hinges—****Blind Hinges—**

Parker.....	75&25
Palmer.....	50&5&10
Seymour.....	70&25
Huffer.....	50
Clark's, Nos. 1, 3, 5, 10 and 50	75&10&5&30
Sargent's Nos. 1, 3, 5, 11, 15	50
Sargent's, No. 12.....	77&10&10
Reading's Gravity.....	75&10&75&10&5
Shepard's.....	
No. 10.....	75&10
Niagara.....	50
Buffalo.....	50
Clark's Genuine Pattern.....	50
O. S. Lull & Porter.....	75&10
Acme, Lull & Porter.....	75
Queen City Reversible.....	75&10&5
Clark's Lull & Porter, Nos. 0, 1, 1 1/2, 2, 2 1/2, 3.....	75&10&25
North's Automatic Blind Hinges, No. 2, for Wood, \$6.00; No. 3, for Brick, \$11.50.....	10

Gate Hinges—

Western.....	7 doz \$4.40, 60
N. E.....	7 doz \$7.00, 55
E. E. Reversible.....	7 doz \$5.20, 55&10
Clark's, Nos. 1, 2, 3.....	60&10&5
N. Y. State.....	7 doz \$5.00, 55&10
Automatic.....	7 doz \$12.50, 50
Common Sense.....	7 doz \$4.50, 50
Seymour's.....	45&10
Shepard's.....	60&10&5
Reed's Latch and Hinges.....	7 doz \$12.00, 50

Spring Hinges—

Geer's Spring and Blank Butts.....	40
Union Spring Hinge Co.'s List, March 1888.....	30
Acme.....	30
U. S.....	25&10
Empire and Crown.....	20
Hero and Monarch.....	20
American, Gem, and Star.....	55
Oxford.....	20
Barker's Double Acting.....	25
Union Mfg. Co.....	25
Bommer's.....	30
Buckman's.....	15&20
Chicago.....	30
Wiles.....	30
Devore's.....	40
Bex.....	40
Royal.....	60
Reliable.....	60
Champion.....	60
Bardley's Patent.....	40
Stearns.....	50&10
Niagara, Holdback Pattern, per gross.....	\$14.00

Wrought Iron Hinges

List February 14, 1891.....	
Strap and T.....	50&10

Corrugated Strap and T.....	50 & 10
Screw Hook and Strap.....	6 to 12 in., 2¢; 14 to 20 in., 3¢; 22 to 36 in., 4¢
Screw Hook and Eye.....	1/4 in., 2¢; 3/4 in., 3¢; 1 in., 4¢
Roller Blind Hinges, Nos. 32 and 34.....	50 & 10
Roller Blind Hinges, Nos. 232 and 234.....	50 & 10
Roller Plate.....	70 & 10
Roller Raised.....	70 & 10
Plate Hinges 8, 10 & 12 in., 1/2 in., 3/4 in., "Providence" over 12 in., 1 in., 1 1/2 in., 2 in., 3 in., 4 in., 5 in., 6 in., 7 in., 8 in., 9 in., 10 in., 11 in., 12 in., 13 in., 14 in., 15 in., 16 in., 17 in., 18 in., 19 in., 20 in., 21 in., 22 in., 23 in., 24 in., 25 in., 26 in., 27 in., 28 in., 29 in., 30 in., 31 in., 32 in., 33 in., 34 in., 35 in., 36 in., 37 in., 38 in., 39 in., 40 in., 41 in., 42 in., 43 in., 44 in., 45 in., 46 in., 47 in., 48 in., 49 in., 50 in., 51 in., 52 in., 53 in., 54 in., 55 in., 56 in., 57 in., 58 in., 59 in., 60 in., 61 in., 62 in., 63 in., 64 in., 65 in., 66 in., 67 in., 68 in., 69 in., 70 in., 71 in., 72 in., 73 in., 74 in., 75 in., 76 in., 77 in., 78 in., 79 in., 80 in., 81 in., 82 in., 83 in., 84 in., 85 in., 86 in., 87 in., 88 in., 89 in., 90 in., 91 in., 92 in., 93 in., 94 in., 95 in., 96 in., 97 in., 98 in., 99 in., 100 in., 101 in., 102 in., 103 in., 104 in., 105 in., 106 in., 107 in., 108 in., 109 in., 110 in., 111 in., 112 in., 113 in., 114 in., 115 in., 116 in., 117 in., 118 in., 119 in., 120 in., 121 in., 122 in., 123 in., 124 in., 125 in., 126 in., 127 in., 128 in., 129 in., 130 in., 131 in., 132 in., 133 in., 134 in., 135 in., 136 in., 137 in., 138 in., 139 in., 140 in., 141 in., 142 in., 143 in., 144 in., 145 in., 146 in., 147 in., 148 in., 149 in., 150 in., 151 in., 152 in., 153 in., 154 in., 155 in., 156 in., 157 in., 158 in., 159 in., 160 in., 161 in., 162 in., 163 in., 164 in., 165 in., 166 in., 167 in., 168 in., 169 in., 170 in., 171 in., 172 in., 173 in., 174 in., 175 in., 176 in., 177 in., 178 in., 179 in., 180 in., 181 in., 182 in., 183 in., 184 in., 185 in., 186 in., 187 in., 188 in., 189 in., 190 in., 191 in., 192 in., 193 in., 194 in., 195 in., 196 in., 197 in., 198 in., 199 in., 200 in., 201 in., 202 in., 203 in., 204 in., 205 in., 206 in., 207 in., 208 in., 209 in., 210 in., 211 in., 212 in., 213 in., 214 in., 215 in., 216 in., 217 in., 218 in., 219 in., 220 in., 221 in., 222 in., 223 in., 224 in., 225 in., 226 in., 227 in., 228 in., 229 in., 230 in., 231 in., 232 in., 233 in., 234 in., 235 in., 236 in., 237 in., 238 in., 239 in., 240 in., 241 in., 242 in., 243 in., 244 in., 245 in., 246 in., 247 in., 248 in., 249 in., 250 in., 251 in., 252 in., 253 in., 254 in., 255 in., 256 in., 257 in., 258 in., 259 in., 260 in., 261 in., 262 in., 263 in., 264 in., 265 in., 266 in., 267 in., 268 in., 269 in., 270 in., 271 in., 272 in., 273 in., 274 in., 275 in., 276 in., 277 in., 278 in., 279 in., 280 in., 281 in., 282 in., 283 in., 284 in., 285 in., 286 in., 287 in., 288 in., 289 in., 290 in., 291 in., 292 in., 293 in., 294 in., 295 in., 296 in., 297 in., 298 in., 299 in., 300 in., 301 in., 302 in., 303 in., 304 in., 305 in., 306 in., 307 in., 308 in., 309 in., 310 in., 311 in., 312 in., 313 in., 314 in., 315 in., 316 in., 317 in., 318 in., 319 in., 320 in., 321 in., 322 in., 323 in., 324 in., 325 in., 326 in., 327 in., 328 in., 329 in., 330 in., 331 in., 332 in., 333 in., 334 in., 335 in., 336 in., 337 in., 338 in., 339 in., 340 in., 341 in., 342 in., 343 in., 344 in., 345 in., 346 in., 347 in., 348 in., 349 in., 350 in., 351 in., 352 in., 353 in., 354 in., 355 in., 356 in., 357 in., 358 in., 359 in., 360 in., 361 in., 362 in., 363 in., 364 in., 365 in., 366 in., 367 in., 368 in., 369 in., 370 in., 371 in., 372 in., 373 in., 374 in., 375 in., 376 in., 377 in., 378 in., 379 in., 380 in., 381 in., 382 in., 383 in., 384 in., 385 in., 386 in., 387 in., 388 in., 389 in., 390 in., 391 in., 392 in., 393 in., 394 in., 395 in., 396 in., 397 in., 398 in., 399 in., 400 in., 401 in., 402 in., 403 in., 404 in., 405 in., 406 in., 407 in., 408 in., 409 in., 410 in., 411 in., 412 in., 413 in., 414 in., 415 in., 416 in., 417 in., 418 in., 419 in., 420 in., 421 in., 422 in., 423 in., 424 in., 425 in., 426 in., 427 in., 428 in., 429 in., 430 in., 431 in., 432 in., 433 in., 434 in., 435 in., 436 in., 437 in., 438 in., 439 in., 440 in., 441 in., 442 in., 443 in., 444 in., 445 in., 446 in., 447 in., 448 in., 449 in., 450 in., 451 in., 452 in., 453 in., 454 in., 455 in., 456 in., 457 in., 458 in., 459 in., 460 in., 461 in., 462 in., 463 in., 464 in., 465 in., 466 in., 467 in., 468 in., 469 in., 470 in., 471 in., 472 in., 473 in., 474 in., 475 in., 476 in., 477 in., 478 in., 479 in., 480 in., 481 in., 482 in., 483 in., 484 in., 485 in., 486 in., 487 in., 488 in., 489 in., 490 in., 491 in., 492 in., 493 in., 494 in., 495 in., 496 in., 497 in., 498 in., 499 in., 500 in., 501 in., 502 in., 503 in., 504 in., 505 in., 506 in., 507 in., 508 in., 509 in., 510 in., 511 in., 512 in., 513 in., 514 in., 515 in., 516 in., 517 in., 518 in., 519 in., 520 in., 521 in., 522 in., 523 in., 524 in., 525 in., 526 in., 527 in., 528 in., 529 in., 530 in., 531 in., 532 in., 533 in., 534 in., 535 in., 536 in., 537 in., 538 in., 539 in., 540 in., 541 in., 542 in., 543 in., 544 in., 545 in., 546 in., 547 in., 548 in., 549 in., 550 in., 551 in., 552 in., 553 in., 554 in., 555 in., 556 in., 557 in., 558 in., 559 in., 560 in., 561 in., 562 in., 563 in., 564 in., 565 in., 566 in., 567 in., 568 in., 569 in., 570 in., 571 in., 572 in., 573 in., 574 in., 575 in., 576 in., 577 in., 578 in., 579 in., 580 in., 581 in., 582 in., 583 in., 584 in., 585 in., 586 in., 587 in., 588 in., 589 in., 590 in., 591 in., 592 in., 593 in., 594 in., 595 in., 596 in., 597 in., 598 in., 599 in., 600 in., 601 in., 602 in., 603 in., 604 in., 605 in., 606 in., 607 in., 608 in., 609 in., 610 in., 611 in., 612 in., 613 in., 614 in., 615 in., 616 in., 617 in., 618 in., 619 in., 620 in., 621 in., 622 in., 623 in., 624 in., 625 in., 626 in., 627 in., 628 in., 629 in., 630 in., 631 in., 632 in., 633 in., 634 in., 635 in., 636 in., 637 in., 638 in., 639 in., 640 in., 641 in., 642 in., 643 in., 644 in., 645 in., 646 in., 647 in., 648 in., 649 in., 650 in., 651 in., 652 in., 653 in., 654 in., 655 in., 656 in., 657 in., 658 in., 659 in., 660 in., 661 in., 662 in., 663 in., 664 in., 665 in., 666 in., 667 in., 668 in., 669 in., 670 in., 671 in., 672 in., 673 in., 674 in., 675 in., 676 in., 677 in., 678 in., 679 in., 680 in., 681 in., 682 in., 683 in., 684 in., 685 in., 686 in., 687 in., 688 in., 689 in., 690 in., 691 in., 692 in., 693 in., 694 in., 695 in., 696 in., 697 in., 698 in., 699 in., 700 in., 701 in., 702 in., 703 in., 704 in., 705 in., 706 in., 707 in., 708 in., 709 in., 710 in., 711 in., 712 in., 713 in., 714 in., 715 in., 716 in., 717 in., 718 in., 719 in., 720 in., 721 in., 722 in., 723 in., 724 in., 725 in., 726 in., 727 in., 728 in., 729 in., 730 in., 731 in., 732 in., 733 in., 734 in., 735 in., 736 in., 737 in., 738 in., 739 in., 740 in., 741 in., 742 in., 743 in., 744 in., 745 in., 746 in., 747 in., 748 in., 749 in., 750 in., 751 in., 752 in., 753 in., 754 in., 755 in., 756 in., 757 in., 758 in., 759 in., 760 in., 761 in., 762 in., 763 in., 764 in., 765 in., 766 in., 767 in., 768 in., 769 in., 770 in., 771 in., 772 in., 773 in., 774 in., 775 in., 776 in., 777 in., 778 in., 779 in., 780 in., 781 in., 782 in., 783 in., 784 in., 785 in., 786 in., 787 in., 788 in., 789 in., 790 in., 791 in., 792 in., 793 in., 794 in., 795 in., 796 in., 797 in., 798 in., 799 in., 800 in., 801 in., 802 in., 803 in., 804 in., 805 in., 806 in., 807 in., 808 in., 809 in., 810 in., 811 in., 812 in., 813 in., 814 in., 815 in., 816 in., 817 in., 818 in., 819 in., 820 in., 821 in., 822 in., 823 in., 824 in., 825 in., 826 in., 827 in., 828 in., 829 in., 830 in., 831 in., 832 in., 833 in., 834 in., 835 in., 836 in., 837 in., 838 in., 839 in., 840 in., 841 in., 842 in., 843 in., 844 in., 845 in., 846 in., 847 in., 848 in., 849 in., 850 in., 851 in., 852 in., 853 in., 854 in., 855 in., 856 in., 857 in., 858 in., 859 in., 860 in., 861 in., 862 in., 863 in., 864 in., 865 in., 866 in., 867 in., 868 in., 869 in., 870 in., 871 in., 872 in., 873 in., 874 in., 875 in., 876 in., 877 in., 878 in., 879 in., 880 in., 881 in., 882 in., 883 in., 884 in., 885 in., 886 in., 887 in., 888 in., 889 in., 890 in., 891 in., 892 in., 893 in., 894 in., 895 in., 896 in., 897 in., 898 in., 899 in., 900 in., 901 in., 902 in., 903 in., 904 in., 905 in., 906 in., 907 in., 908 in., 909 in., 910 in., 911 in., 912 in., 913 in., 914 in., 915 in., 916 in., 917 in., 918 in., 919 in., 920 in., 921 in., 922 in., 923 in., 924 in., 925 in., 926 in., 927 in., 928 in., 929 in., 930 in., 931 in., 932 in., 933 in., 934 in., 935 in., 936 in., 937 in., 938 in., 939 in., 940 in., 941 in., 942 in., 943 in., 944 in., 945 in., 946 in., 947 in., 948 in., 949 in., 950 in., 951 in., 952 in., 953 in., 954 in., 955 in., 956 in., 957 in., 958 in., 959 in., 960 in., 961 in., 962 in., 963 in., 964 in., 965 in., 966 in., 967 in., 968 in., 969 in., 970 in., 971 in., 972 in., 973 in., 974 in., 975 in., 976 in., 977 in., 978 in., 979 in., 980 in., 981 in., 982 in., 983 in., 984 in., 985 in., 986 in., 987 in., 988 in., 989 in., 990 in., 991 in., 992 in., 993 in., 994 in., 995 in., 996 in., 997 in., 998 in., 999 in., 1000 in., 1001 in., 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B. D. for N. E. Hangers—

Small.	Med.	Large.
Per 100 feet.....\$2.15	\$7.40	\$3.35.....net
Terry's Steel Rail, $\frac{1}{2}$ foot.....	45¢	
Canton Lawn Rail, 7 $\frac{1}{2}$ \times 7 foot.....	50¢	
Carrier Steel Rail, $\frac{1}{2}$ foot.....	45¢	
Moore's Wrought Iron.....	35¢	
Rakes—		
Cast Steel, Association goods.....	60¢	70¢
Cast Steel, outside goods.....	60¢	10¢
Maleable.....	70¢	70¢
Grubs Lawn Rake.....	\$12.00	\$54.15
Patton Lawn Rake.....	\$6.00	\$54.15
Fit, Madison Prize Bow Brace & Peers- less.....	60¢	
Top Madison Steel Booth Lawn Rake, \$6.00.....	25¢	
Razors—		
J. B. Torrey Razor Co.....	30¢	
Wostenholme and Butcher, \$10.00 to 2, 10¢		
Jordan's AAAI, new list.....	net	
Jordan's Old Faithful, new list.....	net	
Galvanic.....	\$	\$5.00
Razor Straps—See Straps, Razor.		
Rings and Ringers.		
Union Nut Co.....	55¢	
Sargent's.....	65¢	10¢
Hotchkiss' low list.....	30¢	
Humason, Beckley & Co.'s.....	70¢	10¢
Pick, Stow & W. Co.'s.....	\$5.10	\$50.10
Elrich Hd. W. Co., White Metal, low list, 50¢	\$50.10	
Hog—		
Top of the Hill Ringers.....	$\frac{1}{2}$ doz	\$2.00
Top of the Hill Rings.....	$\frac{1}{2}$ doz	\$1.35
Hill's Improved Ringers.....	$\frac{1}{2}$ doz	\$1.25
Hill's Old Style Ringers.....	$\frac{1}{2}$ doz	\$1.12 $\frac{1}{2}$
Hill's Tongue.....	$\frac{1}{2}$ doz	\$3.00
Cawlinged Rings.....	$\frac{1}{2}$ doz	\$1.00
Perfect Ringers.....	$\frac{1}{2}$ doz	\$1.50
Best Ringers.....	$\frac{1}{2}$ doz	\$2.15
Blair's Hog Ringers.....	$\frac{1}{2}$ doz	\$2.00
Blair's Hog Rings.....	$\frac{1}{2}$ doz	90¢
Champion Ringers.....	$\frac{1}{2}$ doz	\$2.00
Champion Rings, Double.....	$\frac{1}{2}$ doz	\$2.25
Brown's Ringers.....	$\frac{1}{2}$ doz	\$3.00
Electric Hog R'ngs.....	$\frac{1}{2}$ doz boxes	\$1.50
Electric Hog Ringers.....	$\frac{1}{2}$ doz	\$3.6¢
Rivets and Bars—		
Iron, list Nov. 17, '87.....	40¢	
Copper.....	60¢	10¢
Coppered Iron, Bettina Brand.....	40¢	
Rivet Sets—See Sets.		
Rods—		
Stair, Brass.....	25¢	50¢
Stair, Black Walnut.....	$\frac{1}{2}$ doz	40¢
Rollers—		
Barn Door, Sargent's list.....	60¢	10¢
Acme Moore's Anti-Friction.....	55¢	
Union Barn Door Roller.....	70¢	
Rope.		
Manilla, $\frac{1}{4}$ in. and larger.....	$\frac{1}{2}$ in.	95¢
Manilla.....	$\frac{1}{2}$ in.	10¢
Manilla.....	$\frac{1}{2}$ and 5-16 in.	10¢
Manilla.....	$\frac{1}{2}$ and 5-16 in.	95¢
Manilla Hay Rope.....	$\frac{1}{2}$ in.	75¢
Sisal.....	$\frac{1}{2}$ inch and larger	65¢
Sisal.....	$\frac{1}{2}$ in.	75¢
Sisal.....	$\frac{1}{2}$ and 5-16 in.	75¢
Sisal, Hay Rope.....	$\frac{1}{2}$ in.	65¢
Sisal, Tarred Rope.....	$\frac{1}{2}$ in.	65¢
Sisal, Medium Lathe Yarn.....	$\frac{1}{2}$ in.	65¢
Sisal, Large.....	$\frac{1}{2}$ in. and larger	65¢
New Zealand.....	$\frac{1}{2}$ in.	75¢
New Zealand.....	$\frac{1}{2}$ and 5-16 in.	75¢
New Zealand, Hay Rope.....	$\frac{1}{2}$ in.	65¢
New Zealand, Tarred Rope.....	$\frac{1}{2}$ in.	65¢
<i>Note.—Manufacturers' prices on above</i>		
<i>as Buss, f.o.b. factory</i>		
Cotton Rope.....	$\frac{1}{2}$ in.	13¢
Jute Rope.....	$\frac{1}{2}$ in.	6¢
Wire—		
List May 1, 1886.....	32¢	25¢
Iron.....	32¢	25¢
Iron, Galvanized.....	40¢	25¢
Cast Steel.....	40¢	25¢
Rules—		
Boxwood.....	80¢	10¢
Iron.....	50¢	10¢
Starrett's Rule and Straight Edge.....	25¢	10¢
Steel.....	25¢	10¢
Sand Irons—See Irons, Sand.		
Sand and Emery Paper and Cloth—See Paper and Cloth, Sand and Emery		
Sash Cord—See Cord, Sash.		
Sash Locks—See Locks, Sash.		
Sash Weights—See Weights, Sash.		
Sausage Stuffers or Fillers—		
See Stuffers or Fillers, Sausage.		
Saws—		
Atkins's Circular.....	45¢	
Diston's Cross Cuts.....	45¢	
Diston's Hand.....	30¢	
Woodrough & McParlin.....	25¢	
Hand, Panel and Rip.....	25¢	
Narrow Champion Cross Cuts with Handles, $\frac{1}{2}$ foot.....	20¢	
Champion Thin Back Cross Cuts, $\frac{1}{2}$ foot.....	20¢	
Champion Extra Thin Back Cross Cuts, $\frac{1}{2}$ foot.....	21¢	
One Man Champion Cross Cuts, $\frac{1}{2}$ foot.....		

Hack Saws—	
Griffin's, complete.....	40¢10¢50¢
Griffin's Hack Saw, Blades.....	40¢10¢50¢
Star Hack Saws and Blades.....	25¢
Eureka and Crescent.....	25¢
Scroll—	
Lester, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers', \$15.....	25¢
Barnes' Scroll Saw Blades.....	25¢
Saw Frames—See Frames, Saw.	
Saw Sets—See Sets, Saw.	
Saw Tools—See Tools, Saw.	
Scales—	
Hatch, Counter, No. 171, good quality.....	20¢
Hatch, Tea, No. 161.....	20¢
Union Platform, Plain.....	20¢
Union Platform, Striped.....	20¢
Chattillon's Grocers' Trip Scales.....	20¢
Chattillon's Eureka.....	20¢
Chattillon's Favorite.....	20¢
Family, Turnbills.....	20¢
Riehle Bros.' Platform.....	20¢
Scale Beams—See Beams, Scale.	
Scissors, Fluting.....	
Scrapers—	
Adjustable Box Scraper (S. R. & L. Co.).....	20¢
Box, 1 Handle.....	20¢
Box, 2 Handle.....	20¢
Defiance Box and Ship.....	20¢
Foot.....	20¢
Ship, Common.....	20¢
Ship, R. I. Tool Co.....	20¢
Screen Window and Door Frames—See Frames.	
Screw Drivers—See Drivers, Screw.	
Screws.	
Bench and Hand—	
Bench, Iron.....	55¢10¢55¢10¢10¢
Bench, Wood, Beech.....	20¢
Bench, Wood, Hickory.....	20¢
Hand, Wood.....	20¢
Lag, Blunt Point, List Jan. 1, 1890.....	20¢
Coach and Lag, Gimlet Point, List Jan. 1, 1890.....	20¢
Bed.....	20¢
Hand Rail, Sargent's.....	20¢
Hand Rail, H. & I. Mfg. Co.....	20¢
Hand Rail, Am. Screw Co.....	20¢
Jack Screws, Millers Falls List.....	20¢
Jack Screws, P. S. & W.....	20¢
Jack Screws, Sargent's.....	20¢
Jack Screws, Stearns.....	20¢
Cork—	
Humason & Beekley Mfg. Co.....	20¢
Williamson's.....	20¢
Howe Bros. & Hulbert.....	20¢
Machine—	
Flat Head, Iron.....	55¢
Round Head, Iron.....	55¢
Wood—	
List January 1, 1891.	
Flat Head Iron.....	72¢
Round Head Iron.....	72¢
Flat Head Brass.....	72¢
Round Head Brass.....	72¢
Flat Head Bronze.....	72¢
Round Head Bronze.....	72¢
Rogers' Drive Screws.....	33¢
Scroll Saws—See Saws, Scroll.	
Scythes.	
Grain.....	40¢5¢40¢10¢
Grass.....	40¢10¢50¢
Scythe Snaths—See Snaths, Scythe.	
Snaths.	
Avi and Tool.	
Alken's Sets, Axi and Tools,	
No. 20, # dos \$10.00.....	55¢10¢
Key, Adj., Tool Hds., Nos. 1, #12, 2, #18; #15, #20.....	25¢
Miller's Falls Adj. Tool Hds., Nos. 1, #12, 2, #18.....	25¢
Henry's Combination Hart.....	20¢
Brad Sets, No. 43, #10.50; No. 43, #12.50.....	70¢10¢50¢
Stanley's Excelsior, No. 1, #7.50; No. 2, #4.00; No. 3, #6.50.....	30¢10¢
Nail—	
Square.....	20¢
Round.....	20¢
Buck Pros.....	20¢
Cannon's Diamond Point.....	20¢
Rivet.	
Regular List.....	50¢10¢
Saw—	
Stillman's Genuine.....	20¢
Stillman's Imita.....	20¢
Common Lever.....	20¢
Morrill's No. 1, #15.00; No. 2, #14.00; No. 3, #12.00.....	20¢
Leach's, No. 0, #9.00; No. 1, #15.00; No. 2, #12.00.....	20¢
Nash's.....	20¢
Hammer, Hotchkiss.....	20¢
Hammer, Bemis & Call Co.'s new Pat. Hammer.....	20¢
Bemis & Call Co.'s Lever and Spring Hammer.....	20¢
Bemis & Call Co.'s Plate.....	20¢
Bemis & Call Co.'s Cross Cut.....	20¢
Aiken's Genuine.....	20¢
Aiken's Imitation.....	20¢
Bert's Pat. Lever.....	20¢
Dixson's Star.....	20¢
Leopold.....	20¢
Atkin's Lever.....	20¢
Atkin's Criterion.....	20¢
Croissant (Keller), No. 1, #15.00; No. 2, #12.00.....	20¢
Avery's Saw Set and Punch.....	20¢
Chieftain H. B. Co.'s Superior.....	20¢
Sharpeners, Knife.	
Parkins	
Applewood or Candles.....	20¢
Rosewood or Cocoa.....	20¢

Timware—	
Stamped, Japanned and Placed, list Jan. 30 1887.....	70&10&70&10&5
Tire Benders, Upsetters, &c—	
See Benders and Upsetters, Tire.	
Tools.	
Coopers'—	
Bradley's.....	20&30&5
Barton's.....	30&30&5
L. & J. White.....	20&5
Albertson Mfg. Co.....	25
Beatty's.....	30&30&5
Sandusky Tool Co.....	30&30&5
Shaves, Cincinnati Tool Co.....	30&30&5
Lumber.	
Ring Peavies, "Blue Line".....	20&30&5
Ring Peavies, Common.....	20&30&5
Steel Socket Peavies.....	20&30&5
Mail Iron Socket Peavies.....	20&30&5
Cant Hooks, "Blue Line".....	20&30&5
Cant Hooks, Common Finish.....	20&30&5
Cant Hooks, Mail Socket Clasp, "Blue Line" Finish.....	20&30&5
Cant Hooks, Mail Socket Clasp, Common Finish.....	20&30&5
Cant Hooks, Clip Clasp, "Blue Line" Finish.....	20&30&5
Cant Hooks, Clip Clasp, Common Finish.....	20&30&5
Hand Spikes.....	20&30&5
Pike Poles, Pike & Hook, 12 ft., 11.50; 14 ft., 12.50; 16 ft., 13.50; 18 ft., 14.50; 20 ft., 15.50; 22 ft., 16.50; 24 ft., 17.50; 26 ft., 18.50; 28 ft., 19.50; 30 ft., 20.50; 32 ft., 21.50; 34 ft., 22.50; 36 ft., 23.50; 38 ft., 24.50; 40 ft., 25.50; 42 ft., 26.50; 44 ft., 27.50; 46 ft., 28.50; 48 ft., 29.50; 50 ft., 30.50; 52 ft., 31.50; 54 ft., 32.50; 56 ft., 33.50; 58 ft., 34.50; 60 ft., 35.50; 62 ft., 36.50; 64 ft., 37.50; 66 ft., 38.50; 68 ft., 39.50; 70 ft., 40.50; 72 ft., 41.50; 74 ft., 42.50; 76 ft., 43.50; 78 ft., 44.50; 80 ft., 45.50; 82 ft., 46.50; 84 ft., 47.50; 86 ft., 48.50; 88 ft., 49.50; 90 ft., 50.50; 92 ft., 51.50; 94 ft., 52.50; 96 ft., 53.50; 98 ft., 54.50; 100 ft., 55.50; 102 ft., 56.50; 104 ft., 57.50; 106 ft., 58.50; 108 ft., 59.50; 110 ft., 60.50; 112 ft., 61.50; 114 ft., 62.50; 116 ft., 63.50; 118 ft., 64.50; 120 ft., 65.50; 122 ft., 66.50; 124 ft., 67.50; 126 ft., 68.50; 128 ft., 69.50; 130 ft., 70.50; 132 ft., 71.50; 134 ft., 72.50; 136 ft., 73.50; 138 ft., 74.50; 140 ft., 75.50; 142 ft., 76.50; 144 ft., 77.50; 146 ft., 78.50; 148 ft., 79.50; 150 ft., 80.50; 152 ft., 81.50; 154 ft., 82.50; 156 ft., 83.50; 158 ft., 84.50; 160 ft., 85.50; 162 ft., 86.50; 164 ft., 87.50; 166 ft., 88.50; 168 ft., 89.50; 170 ft., 90.50; 172 ft., 91.50; 174 ft., 92.50; 176 ft., 93.50; 178 ft., 94.50; 180 ft., 95.50; 182 ft., 96.50; 184 ft., 97.50; 186 ft., 98.50; 188 ft., 99.50; 190 ft., 100.50; 192 ft., 101.50; 194 ft., 102.50; 196 ft., 103.50; 198 ft., 104.50; 200 ft., 105.50; 202 ft., 106.50; 204 ft., 107.50; 206 ft., 108.50; 208 ft., 109.50; 210 ft., 110.50; 212 ft., 111.50; 214 ft., 112.50; 216 ft., 113.50; 218 ft., 114.50; 220 ft., 115.50; 222 ft., 116.50; 224 ft., 117.50; 226 ft., 118.50; 228 ft., 119.50; 230 ft., 120.50; 232 ft., 121.50; 234 ft., 122.50; 236 ft., 123.50; 238 ft., 124.50; 240 ft., 125.50; 242 ft., 126.50; 244 ft., 127.50; 246 ft., 128.50; 248 ft., 129.50; 250 ft., 130.50; 252 ft., 131.50; 254 ft., 132.50; 256 ft., 133.50; 258 ft., 134.50; 260 ft., 135.50; 262 ft., 136.50; 264 ft., 137.50; 266 ft., 138.50; 268 ft., 139.50; 270 ft., 140.50; 272 ft., 141.50; 274 ft., 142.50; 276 ft., 143.50; 278 ft., 144.50; 280 ft., 145.50; 282 ft., 146.50; 284 ft., 147.50; 286 ft., 148.50; 288 ft., 149.50; 290 ft., 150.50; 292 ft., 151.50; 294 ft., 152.50; 296 ft., 153.50; 298 ft., 154.50; 300 ft., 155.50; 302 ft., 156.50; 304 ft., 157.50; 306 ft., 158.50; 308 ft., 159.50; 310 ft., 160.50; 312 ft., 161.50; 314 ft., 162.50; 316 ft., 163.50; 318 ft., 164.50; 320 ft., 165.50; 322 ft., 166.50; 324 ft., 167.50; 326 ft., 168.50; 328 ft., 169.50; 330 ft., 170.50; 332 ft., 171.50; 334 ft., 172.50; 336 ft., 173.50; 338 ft., 174.50; 340 ft., 175.50; 342 ft., 176.50; 344 ft., 177.50; 346 ft., 178.50; 348 ft., 179.50; 350 ft., 180.50; 352 ft., 181.50; 354 ft., 182.50; 356 ft., 183.50; 358 ft., 184.50; 360 ft., 185.50; 362 ft., 186.50; 364 ft., 187.50; 366 ft., 188.50; 368 ft., 189.50; 370 ft., 190.50; 372 ft., 191.50; 374 ft., 192.50; 376 ft., 193.50; 378 ft., 194.50; 380 ft., 195.50; 382 ft., 196.50; 384 ft., 197.50; 386 ft., 198.50; 388 ft., 199.50; 390 ft., 200.50; 392 ft., 201.50; 394 ft., 202.50; 396 ft., 203.50; 398 ft., 204.50; 400 ft., 205.50; 402 ft., 206.50; 404 ft., 207.50; 406 ft., 208.50; 408 ft., 209.50; 410 ft., 210.50; 412 ft., 211.50; 414 ft., 212.50; 416 ft., 213.50; 418 ft., 214.50; 420 ft., 215.50; 422 ft., 216.50; 424 ft., 217.50; 426 ft., 218.50; 428 ft., 219.50; 430 ft., 220.50; 432 ft., 221.50; 434 ft., 222.50; 436 ft., 223.50; 438 ft., 224.50; 440 ft., 225.50; 442 ft., 226.50; 444 ft., 227.50; 446 ft., 228.50; 448 ft., 229.50; 450 ft., 230.50; 452 ft., 231.50; 454 ft., 232.50; 456 ft., 233.50; 458 ft., 234.50; 460 ft., 235.50; 462 ft., 236.50; 464 ft., 237.50; 466 ft., 238.50; 468 ft., 239.50; 470 ft., 240.50; 472 ft., 241.50; 474 ft., 242.50; 476 ft., 243.50; 478 ft., 244.50; 480 ft., 245.50; 482 ft., 246.50; 484 ft., 247.50; 486 ft., 248.50; 488 ft., 249.50; 490 ft., 250.50; 492 ft., 251.50; 494 ft., 252.50; 496 ft., 253.50; 498 ft., 254.50; 500 ft., 255.50; 502 ft., 256.50; 504 ft., 257.50; 506 ft., 258.50; 508 ft., 259.50; 510 ft., 260.50; 512 ft., 261.50; 514 ft., 262.50; 516 ft., 263.50; 518 ft., 264.50; 520 ft., 265.50; 522 ft., 266.50; 524 ft., 267.50; 526 ft., 268.50; 528 ft., 269.50; 530 ft., 270.50; 532 ft., 271.50; 534 ft., 272.50; 536 ft., 273.50; 538 ft., 274.50; 540 ft., 275.50; 542 ft., 276.50; 544 ft., 277.50; 546 ft., 278.50; 548 ft., 279.50; 550 ft., 280.50; 552 ft., 281.50; 554 ft., 282.50; 556 ft., 283.50; 558 ft., 284.50; 560 ft., 285.50; 562 ft., 286.50; 564 ft., 287.50; 566 ft., 288.50; 568 ft., 289.50; 570 ft., 290.50; 572 ft., 291.50; 574 ft., 292.50; 576 ft., 293.50; 578 ft., 294.50; 580 ft., 295.50; 582 ft., 296.50; 584 ft., 297.50; 586 ft., 298.50; 588 ft., 299.50; 590 ft., 300.50; 592 ft., 301.50; 594 ft., 302.50; 596 ft., 303.50; 598 ft., 304.50; 600 ft., 305.50; 602 ft., 306.50; 604 ft., 307.50; 606 ft., 308.50; 608 ft., 309.50; 610 ft., 310.50; 612 ft., 311.50; 614 ft., 312.50; 616 ft., 313.50; 618 ft., 314.50; 620 ft., 315.50; 622 ft., 316.50; 624 ft., 317.50; 626 ft., 318.50; 628 ft., 319.50; 630 ft., 320.50; 632 ft., 321.50; 634 ft., 322.50; 636 ft., 323.50; 638 ft., 324.50; 640 ft., 325.50; 642 ft., 326.50; 644 ft., 327.50; 646 ft., 328.50; 648 ft., 329.50; 650 ft., 330.50; 652 ft., 331.50; 654 ft., 332.50; 656 ft., 333.50; 658 ft., 334.50; 660 ft., 335.50; 662 ft., 336.50; 664 ft., 337.50; 666 ft., 338.50; 668 ft., 339.50; 670 ft., 340.50; 672 ft., 341.50; 674 ft., 342.50; 676 ft., 343.50; 678 ft., 344.50; 680 ft., 345.50; 682 ft., 346.50; 684 ft., 347.50; 686 ft., 348.50; 688 ft., 349.50; 690 ft., 350.50; 692 ft., 351.50; 694 ft., 352.50; 696 ft., 353.50; 698 ft., 354.50; 700 ft., 355.50; 702 ft., 356.50; 704 ft., 357.50; 706 ft., 358.50; 708 ft., 359.50; 710 ft., 360.50; 712 ft., 361.50; 714 ft., 362.50; 716 ft., 363.50; 718 ft., 364.50; 720 ft., 365.50; 722 ft., 366.50; 724 ft., 367.50; 726 ft., 368.50; 728 ft., 369.50; 730 ft., 370.50; 732 ft., 371.50; 734 ft., 372.50; 736 ft., 373.50; 738 ft., 374.50; 740 ft., 375.50; 742 ft., 376.50; 744 ft., 377.50; 746 ft., 378.50; 748 ft., 379.50; 750 ft., 380.50; 752 ft., 381.50; 754 ft., 382.50; 756 ft., 383.50; 758 ft., 384.50; 760 ft., 385.50; 762 ft., 386.50; 764 ft., 387.50; 766 ft., 388.50; 768 ft., 389.50; 770 ft., 390.50; 772 ft., 391.50; 774 ft., 392.50; 776 ft., 393.50; 778 ft., 394.50; 780 ft., 395.50; 782 ft., 396.50; 784 ft., 397.50; 786 ft., 398.50; 788 ft., 399.50; 790 ft., 400.50; 792 ft., 401.50; 794 ft., 402.50; 796 ft., 403.50; 798 ft., 404.50; 800 ft., 405.50; 802 ft., 406.50; 804 ft., 407.50; 806 ft., 408.50; 808 ft., 409.50; 810 ft., 410.50; 812 ft., 411.50; 814 ft., 412.50; 816 ft., 413.50; 818 ft., 414.50; 820 ft., 415.50; 822 ft., 416.50; 824 ft., 417.50; 826 ft., 418.50; 828 ft., 419.50; 830 ft., 420.50; 832 ft., 421.50; 834 ft., 422.50; 836 ft., 423.50; 838 ft., 424.50; 840 ft., 425.50; 842 ft., 426.50; 844 ft., 427.50; 846 ft., 428.50; 848 ft., 429.50; 850 ft., 430.50; 852 ft., 431.50; 854 ft., 432.50; 856 ft., 433.50; 858 ft., 434.50; 860 ft., 435.50; 862 ft., 436.50; 864 ft., 437.50; 866 ft., 438.50; 868 ft., 439.50; 870 ft., 440.50; 872 ft., 441.50; 874 ft., 442.50; 876 ft., 443.50; 878 ft., 444.50; 880 ft., 445.50; 882 ft., 446.50; 884 ft., 447.50; 886 ft., 448.50; 888 ft., 449.50; 890 ft., 450.50; 892 ft., 451.50; 894 ft., 452.50; 896 ft., 453.50; 898 ft., 454.50; 900 ft., 455.50; 902 ft., 456.50; 904 ft., 457.50; 906 ft., 458.50; 908 ft., 459.50; 910 ft., 460.50; 912 ft., 461.50; 914 ft., 462.50; 916 ft., 463.50; 918 ft., 464.50; 920 ft., 465.50; 922 ft., 466.50; 924 ft., 467.50; 926 ft., 468.50; 928 ft., 469.50; 930 ft., 470.50; 932 ft., 471.50; 934 ft., 472.50; 936 ft., 473.50; 938 ft., 474.50; 940 ft., 475.50; 942 ft., 476.50; 944 ft., 477.50; 946 ft., 478.50; 948 ft., 479.50; 950 ft., 480.50; 952 ft., 481.50; 954 ft., 482.50; 956 ft., 483.50; 958 ft., 484.50; 960 ft., 485.50; 962 ft., 486.50; 964 ft., 487.50; 966 ft., 488.50; 968 ft., 489.50; 970 ft., 490.50; 972 ft., 491.50; 974 ft., 492.50; 976 ft., 493.50; 978 ft., 494.50; 980 ft., 495.50; 982 ft., 496.50; 984 ft., 497.50; 986 ft., 498.50; 988 ft., 499.50; 990 ft., 500.50; 992 ft., 501.50; 994 ft., 502.50; 996 ft., 503.50; 998 ft., 504.50; 1000 ft., 505.50; 1002 ft., 506.50; 1004 ft., 507.50; 1006 ft., 508.50; 1008 ft., 509.50; 1010 ft., 510.50; 1012 ft., 511.50; 1014 ft., 512.50; 1016 ft., 513.50; 1018 ft., 514.50; 1020 ft., 515.50; 1022 ft., 516.50; 1024 ft., 517.50; 1026 ft., 518.50; 1028 ft., 519.50; 1030 ft., 520.50; 1032 ft., 521.50; 1034 ft., 522.50; 1036 ft., 523.50; 1038 ft., 524.50; 1040 ft., 525.50; 1042 ft., 526.50; 1044 ft., 527.50; 1046 ft., 528.50; 1048 ft., 529.50; 1050 ft., 530.50; 1052 ft., 531.50; 1054 ft., 532.50; 1056 ft., 533.50; 1058 ft., 534.50; 1060 ft., 535.50; 1062 ft., 536.50; 1064 ft., 537.50; 1066 ft., 538.50; 1068 ft., 539.50; 1070 ft., 540.50; 1072 ft., 541.50; 1074 ft., 542.50; 1076 ft., 543.50; 1078 ft., 544.50; 1080 ft., 545.50; 1082 ft., 546.50; 1084 ft., 547.50; 1086 ft., 548.50; 1088 ft., 549.50; 1090 ft., 550.50; 1092 ft., 551.50; 1094 ft., 552.50; 1096 ft., 553.50; 1098 ft., 554.50; 1100 ft., 555.50; 1102 ft., 556.50; 1104 ft., 557.50; 1106 ft., 558.50; 1108 ft., 559.50; 1110 ft., 560.50; 1112 ft., 561.50; 1114 ft., 562.50; 1116 ft., 563.50; 1118 ft., 564.50; 1120 ft., 565.50; 1122 ft., 566.50; 1124 ft., 567.50; 1126 ft., 568.50; 1128 ft., 569.50; 1130 ft., 570.50; 1132 ft., 571.50; 1134 ft., 572.50; 1136 ft., 573.50; 1138 ft., 574.50; 1140 ft., 575.50; 1142 ft., 576.50; 1144 ft., 577.50; 1146 ft., 578.50; 1148 ft., 579.50; 1150 ft., 580.50; 1152 ft., 581.50; 1154 ft., 582.50; 1156 ft., 583.50; 1158 ft., 584.50; 1160 ft., 585.50; 1162 ft., 586.50; 1164 ft., 587.50; 1166 ft., 588.50; 1168 ft., 589.50; 1170 ft., 590.50; 1172 ft., 591.50; 1174 ft., 592.50; 1176 ft., 593.50; 1178 ft., 594.50; 1180 ft., 595.50; 1182 ft., 596.50; 1184 ft., 597.50; 1186 ft., 598.50; 1188 ft., 599.50; 1190 ft., 600.50; 1192 ft., 601.50; 1194 ft., 602.50; 1196 ft., 603.50; 1198 ft., 604.50; 1200 ft., 605.50; 1202 ft., 606.50; 1204 ft., 607.50; 1206 ft., 608.50; 1208 ft., 609.50; 1210 ft., 610.50; 1212 ft., 611.50; 1214 ft., 612.50; 1216 ft., 613.50; 1218 ft., 614.50; 1220 ft., 615.50; 1222 ft., 616.50; 1224 ft., 617.50; 1226 ft., 618.50; 1228 ft., 619.50; 1230 ft., 620.50; 1232 ft., 621.50; 1234 ft., 622.50; 1236 ft., 623.50; 1238 ft., 624.50; 1240 ft., 625.50; 1242 ft., 626.50; 1244 ft., 627.50; 1246 ft., 628.50; 1248 ft., 629.50; 1250 ft., 630.50; 1252 ft., 631.50; 1254 ft., 632.50; 1256 ft., 633.50; 1258 ft., 634.50; 1260 ft., 635.50; 1262 ft., 636.50; 1264 ft., 637.50; 1266 ft., 638.50; 1268 ft., 639.50; 1270 ft., 640.50; 1272 ft., 641.50; 1274 ft., 642.50; 1276 ft., 643.50; 1278 ft., 644.50; 1280 ft., 645.50; 1282 ft., 646.50; 1284 ft., 647.50; 1286 ft., 648.50; 1288 ft., 649.50; 1290 ft., 650.50; 1292 ft., 651.50; 1294 ft., 652.50; 1296 ft., 653.50; 1298 ft., 654.50; 1300 ft., 655.50; 1302 ft., 656.50; 1304 ft., 657.50; 1306 ft., 658.50; 1308 ft., 659.50; 1310 ft., 660.50; 1312 ft., 661.50; 1314 ft., 662.50; 1316 ft., 663.50; 1318 ft., 664.50; 1320 ft., 665.50; 1322 ft., 666.50; 1324 ft., 667.50; 1326 ft., 668.50; 1328 ft., 669.50; 1330 ft., 670.50; 1332 ft., 671.50; 1334 ft., 672.50; 1336 ft., 673.50; 1338 ft., 674.50; 1340 ft., 675.50; 1342 ft., 676.50; 1344 ft., 677.50; 1346 ft., 678.50; 1348 ft., 679.50; 1350 ft., 680.50; 1352 ft., 681.50; 1354 ft., 682.50; 1356 ft., 683.50; 1358 ft., 684.50; 1360 ft., 685.50; 1362 ft., 686.50; 1364 ft., 687.50; 1366 ft., 688.50; 1368 ft., 689.50; 1370 ft., 690.50; 1372 ft., 691.50; 1374 ft., 692.50; 1376 ft., 693.50; 1378 ft., 694.50; 1380 ft., 695.50; 1382 ft., 696.50; 1384 ft., 697.50; 1386 ft., 698.50; 1388 ft., 699.50; 1390 ft., 700.50; 1392 ft., 701.50; 1394 ft., 702.50; 1396 ft., 703.50; 1398 ft., 704.50; 1400 ft., 705.50; 1402 ft., 706.50; 1404 ft., 707.50; 1406 ft., 708.50; 1408 ft., 709.50; 1410 ft., 710.50; 1412 ft., 711.50; 1414 ft., 712.50; 1416 ft., 713.50; 1418 ft., 714.50; 1420 ft., 715.50; 1422 ft., 716.50; 1424 ft., 717.50; 1426 ft., 718.50; 1428 ft., 719.50; 1430 ft., 720.50; 1432 ft., 721.50; 1434 ft., 722.50; 1436 ft., 723.50; 1438 ft., 724.50; 1440 ft., 725.50; 1442 ft., 726.50; 1444 ft., 727.50; 1446 ft., 728.50; 1448 ft., 729.50; 1450 ft., 730.50; 1452 ft., 731.50; 1454 ft., 732.50; 1456 ft., 733.50; 1458 ft., 734.50; 1460 ft., 735.50; 1462 ft., 736.50; 1464 ft., 737.50; 1466 ft., 738.50; 1468 ft., 739.50; 1470 ft., 740.50; 1472 ft., 741.50; 1474 ft., 742.50; 1476 ft., 743.50; 1478 ft., 744.50; 1480 ft., 745.50; 1482 ft., 746.50; 1484 ft., 747.50; 1486 ft., 748.50; 1488 ft., 749.50; 1490 ft., 750.50; 1492 ft., 751.50; 1494 ft., 752.50; 1496 ft., 753.50; 1498 ft., 754.50; 1500 ft., 755.50; 1502 ft., 756.50; 1504 ft., 757.50; 1506 ft., 758.50; 1508 ft., 759.50; 1510 ft., 760.50; 1512 ft., 761.50; 1514 ft., 762.50; 1516 ft., 763.50; 1518 ft., 764.50; 1520 ft., 765.50; 1522 ft., 766.50; 1524 ft., 767.50; 1526 ft., 768.50; 1528 ft., 769.50; 1530 ft., 770.50; 1532 ft., 771.50; 1534 ft., 772.50; 1536 ft., 773.50; 1538 ft., 774.50; 1540 ft., 775.50; 1542 ft., 776.50; 1544 ft., 777.50; 1546 ft., 778.50; 1548 ft., 779.50; 1550 ft., 780.50; 1552 ft., 781.50; 1554 ft., 782.50; 1556 ft., 783.50; 1558 ft., 784.50; 1560 ft., 785.50; 1562 ft., 786.50; 1564 ft., 787.50; 1566 ft., 788.50; 1568 ft., 789.50; 1570 ft., 790.50; 1572 ft., 791.50; 1574 ft., 792.50; 1576 ft., 793.50; 1578 ft., 794.50; 1580 ft., 795.50; 1582 ft., 796.50; 1584 ft., 797.50; 1586 ft., 798.50; 1588 ft., 799.50; 1590 ft., 800.50; 1592 ft., 801.50; 1594 ft., 802.50; 1596 ft., 803.50; 1598 ft., 804.50; 1600 ft., 805.50; 1602 ft., 806.50; 1604 ft., 807.50; 1606 ft., 808.50; 1608 ft., 809.50; 1610 ft., 810.50; 1612 ft., 811	

CURRENT METAL PRICES.

SEPTEMBER 2, 1891.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
1 to 2 in. round and square.	2.00 @ 2.10
1 to 6 in. x 1/4 to 1 in.	
Refined Iron:	
1 to 2 in. round and square.	2.10 @ 2.30
1 to 4 in. x 1/4 to 1 in.	
4 1/4 to 6 in. x 1/4 to 1 in.	
1 to 6 in. x 1/4 and 5-16.	2.30 @ 2.50
Rods—1/4 and 11-16 round and sq.	2.20 @ 2.40
Bands—1 to 6 x 3-16 to No. 12.	2.40 @ 2.60
"Burden Best" Iron, base price.	3.00
Burden's "H. B. & S." Iron, base price.	2.80
Ulster.	3.00
Norway Bars.	4.00
Norway Shapes.	5.00

Merchant Steel from Store.

Open-Hearth and Bessemer Machinery,	
Toe Calk, Tire and Sleigh Shoe, base price in small lots.	2 3/4
Best Cast Steel, base price in small lots.	5
Best Cast Steel Machinery, base price in small lots.	5

Sheet Iron from Store.

	Common American.	R. G.	Cleaned.
10 to 16.	3.00 @ 3.00	3.35	
17 to 20.	3.15 @ 3.25	3.35	3.75
21 to 24.	3.35 @ 3.35	3.60	
25 and 30.	3.35 @ 3.60	3.60	
37.	3.50 @ 3.60	3.85	
38.	3.65 @ 4.10		
B. R.		3d qual.	
Galv'd, 14 to 30.	4.75 @ 4.90		
Galv'd, 21 to 24.	5.12 @ 5.00		
Galv'd, 25 to 26.	5.50 @ 5.35		
Galv'd, 27.	5.90 @ 5.70		
Galv'd, 28.	6.35 @ 6.10		
Patent Finished.	10 1/2 @ 11		
Russia.	10 1/2 @ 11		
American Cold Rolled B. R.	5 1/2 @ 7		
Craig Polished Sheet Steel.	5 1/2 @ 6		

English Steel from Store.

Best Cast.	15
Extra Cast.	16 1/2
Swaged, Cast.	16
Best Double Shear.	15
Blister, 1st quality.	12
German Steel, Best.	10
2d quality.	9
3d quality.	8
Sheet Cast Steel, 1st quality.	14
2d quality.	13
3d quality.	12 1/2
R. Mushet's "Special"	48
"Titanic"	30

METALS.

Tin.

Banca, Pigs.	23 1/4
Straits, Pigs.	22 1/2
Straits in Bars	24

Tin Plates.

	Charcoal Plates.—Bright.	Per box.
Melny Grade.	IC, 10 x 14.	8.75
"	IC, 12 x 12.	7.00
"	IC, 14 x 20.	6.75
"	IC, 20 x 28.	13.70
"	IX, 10 x 14.	8.25
"	IX, 12 x 12.	8.50
"	IX, 14 x 20.	8.25
"	IX, 20 x 28.	16.50
"	DC, 12 1/2 x 17.	6.25
"	DX, 12 1/2 x 17.	7.75
Calland Grade.	IC, 10 x 14.	6.70
"	IC, 12 x 12.	6.95
"	IC, 14 x 20.	6.60
"	IX, 10 x 14.	7.85
"	IX, 12 x 12.	8.20
"	IX, 14 x 20.	7.85
Allaway Grade.	IC, 10 x 14.	6.35
"	IC, 12 x 12.	6.50
"	IC, 14 x 20.	6.35
"	IC, 20 x 28.	12.40
"	IX, 10 x 14.	7.50
"	IX, 12 x 12.	7.80
"	IX, 14 x 20.	7.50
"	IX, 20 x 28.	15.00
"	DC, 12 1/2 x 17.	6.80
"	DX, 12 1/2 x 17.	7.00

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20.	8.70
10 x 20.	8.10
20 x 28.	11.70
IX, 10 x 14, 14 x 20.	6.60
IX, 10 x 14, 14 x 20.	5.70

Charcoal Plates.—Terns.

Dean Grade.—IC, 14 x 20.	10.60
20 x 28.	10.60
IX, 14 x 20.	6.20
20 x 28.	12.35
Abecarne Grade.—IC, 14 x 20.	5.25
20 x 28.	10.60
IX, 14 x 20.	6.35
20 x 28.	12.35

Tin Boiler Plates.

IXX, 14 x 26.	112 sheets.	13.50
IXX, 14 x 28.	112 sheets.	13.75
IXX, 14 x 31.	112 sheets.	15.25

Copper.

Duty: Pig, Bar and Ingot, 1 1/4¢; Old Copper, 1¢
 Manufactured (including all articles of which Copper is a component of chief value), 3 1/2¢ ad valorem.

Ingot

Lake.	13
Ansonia Grade Arizona.	12 1/4
Ansonia Grade Casting.	12

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 5, 1890, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound.
Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.
30—72	22	22	23
30—72	22	22	23
36—96	22	22	23
36—96	22	22	23
48—96	22	22	23
48—96	22	22	23
50—96	22	22	23
50—96	22	22	23
60—96	22	22	23
60—96	22	22	23
84—96	22	22	23
84—96	22	22	23
Over 84 in. wide	25	27	

All Bath Tub Sheets.... 16 oz. 14 oz. 12 oz. 10 oz.
 Per pound..... 30.27 0.29 0.31 0.35
 Bolt Copper, 1/4 inch diameter and over, per pound..... 23
 Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Copper Bottoms, Pits and Flats.

14 ounce to square foot and heavier..... 30¢
 12 ounce and up to 14 ounce to square foot..... 27¢
 10 ounce and up to 12 ounce..... 24¢
 Lighter than 10 ounce..... 22¢
 Circles less than 8 inches diameter 2 cents per pound additional.
 Circles over 18 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each..... 8¢
 Tinning sheets on one side, 30 x 60 each..... 30¢
 For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each..... 15¢
 For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each..... 12¢
 For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each..... 13¢
 Tinning sheets on one side, other sizes, per square foot..... 2 1/2¢
 For tinning both sides double the above prices.

Finished Brass and Copper.

14 x 48, 14 x 62, 14 x 56, 14 x 60 in.
 14 and 16 oz. and heavier..... 33¢ By the case..... 34¢
 12 oz. and lighter..... 35¢ By the case..... 34¢
 24 x 48 and 30 x 60.
 14 and 16 oz. and heavier..... 30¢ 12 oz..... 30¢

Seamless Brass and Copper Tubes.

O. G.	N. G.	%	%	%	%	1	1 1/2
8-14	6-12	87	83	30	29	28	27
15	13	86	84	31	30	29	28
16	14	39	34	32	31	30	29
17	15	40	35	33	30	31	30
18	16	42	36	34	32	31	30
19	17	43	37	35	34	33	32
20	18-19	44	39	37	36	35	34
21	20	46	41	39	38	37	36
22	21	48	42	40	39	38	37
23	22	50	44	42	41	40	39
24	23	53	46	44	43	41	40
25	24	56	49	46	45	44	43

Copper Bronze and Gilding Tube, 3¢ # additional.

Drawn Brass Tubing. (To No. 20, inclusive.)

Above 5-16 inch to 3 inch, inclusive..... 35¢
 Plain, above 3 inch..... 45¢
 Plain, 5-16 inch..... 45¢
 Plain, 3/8 inch..... 45¢
 Plain, 1/2 inch..... 45¢
 Plain, 3/4 inch..... 45¢
 Plain, 1 inch..... 45¢
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